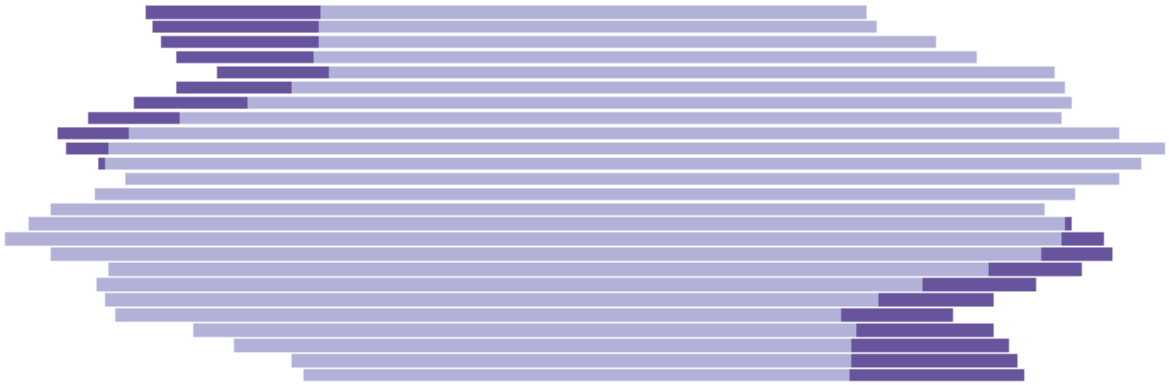
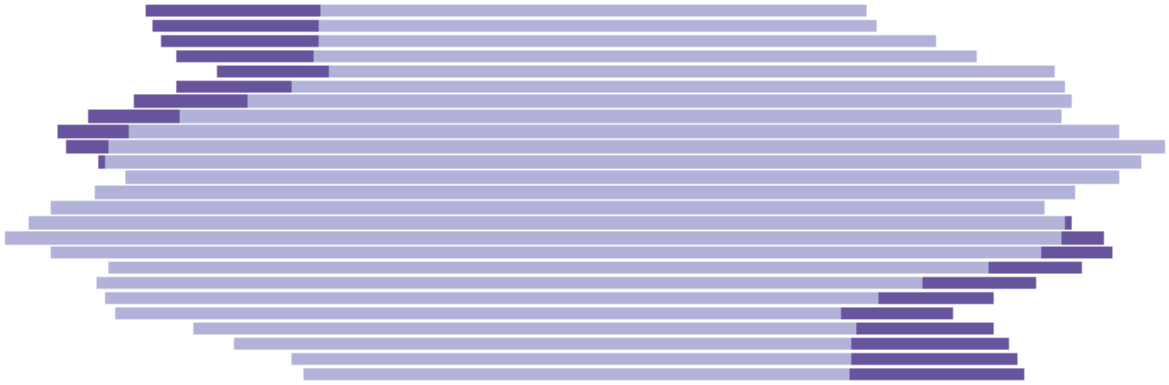
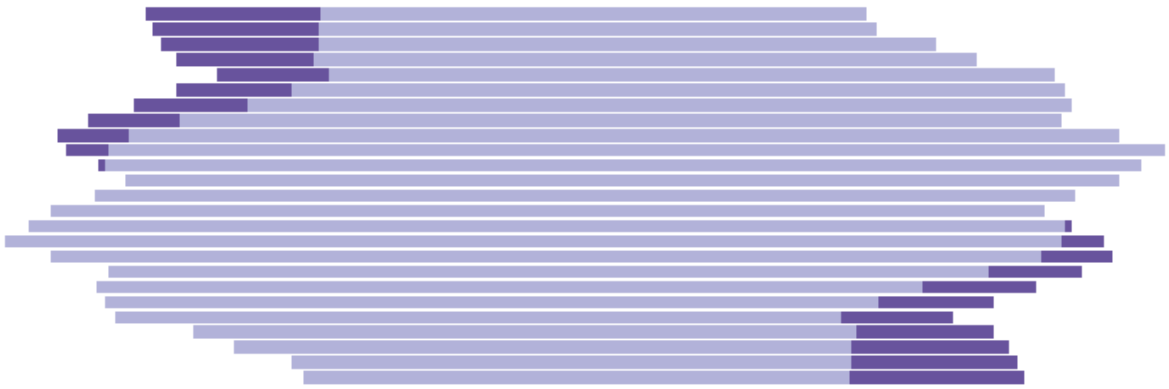


The Impact Of Digitization On Product Innovation In The Recorded Music Industry



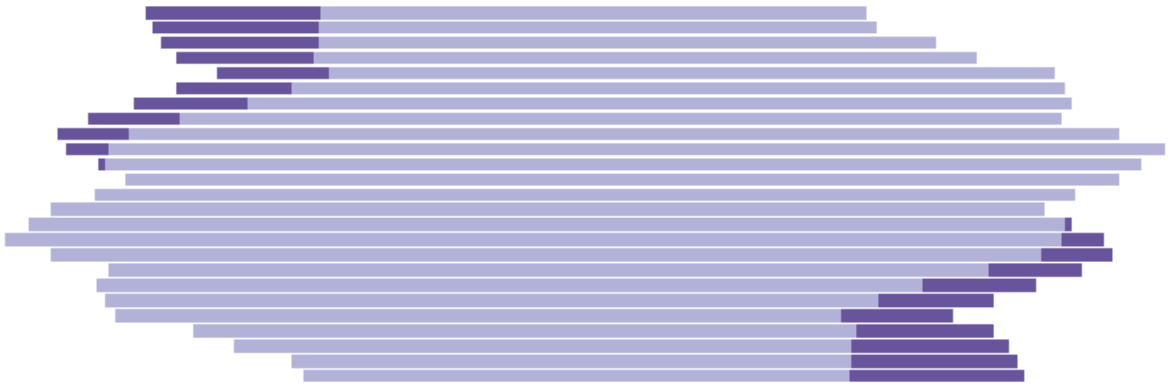
Master Thesis (Cultural Economics & Entrepreneurship)

Date - 08.06.2015



Bhagyalakshmi Daga / 385590

Supervisor - Dr. C.W.Handke



Abstract

Digital music market has been around for more than a decade now. In spite of increasing digital sales, the overall revenues earned yearly are declining.

The biggest concern with the digitization of music industry has been the ease in illegal copying of music files. For several years file-sharing platforms have been held accountable for the falling revenues of the industry. Extending that logic, if labels/artists do not receive an income from their work, file-sharing should then also discourage new artists to then enter the market, as well as lead to a decrease in the creation of new works (product innovation).

One other discussion is the democratization of the music market with digitization. Because digitization also reduces entry barriers and creates a level playing field, the adoption of a digital market to buy and sell music should ideally lead to a dispersion of market power. A contestable market should be witnessed, with new music works and new artists competing for larger market shares.

Using data acquired from weekly Billboard Hot 100 chart, this empirical research makes a comparison of two periods in time, and demonstrates the effect of the digital retail market as well as the illegal copying of music files on the creation of new works and the inclusion of new artists into the market.

Based on the analysis, a general downward trend is witnessed in the music market in terms of creation and innovation. Results from this research indicate that illegal copying does not affect the supply of new works and new artists entering the music market. Furthermore, digital market may not be conducive for newcomers to compete freely, indicating the presence of a superstar economy in the music industry. With digital retailers gaining in terms of revenue, the discussion points towards a mere transfer of market power from the major labels to the new digital intermediaries.

Keywords: Digitization, music industry, contestability, innovation, file-sharing

Acknowledgement

This thesis may be my work on the keyboard, but its realization has come with the support of a lot of people, and naturally, *thank yous* are in order.

First and foremost to Dr. Handke for the constant enthusiasm and encouragement, and for not laughing at my ideas.

To the CEE faculty for introducing me to a whole new world of art and culture.

To friends and family for listening to me overanalyze my thesis at 2 am without understanding a word.

To Akshan Ish for making my thesis presentable with that cover art*.

And finally, gratitude extended towards Nils Frahm and Ólafur Arnalds for the constant aural support.

* The cover image is a visualization of the digital and total music sales in the US (1990-2014).

Table of Contents

1 Introduction

The music industry had advanced so much technologically in just the last 40-50 years that a variety of industry products have found a permanent place as artifacts in cultural museums[1]. Indeed, technology has always been fundamental in the music industry. Whether it was the shift from sheet music to recorded music, or from cassettes to mp3, each monumental milestone in the industry is tied to the emergence of one technology or the other. With digital technology, in particular, came the restructuring of the industry organization; old business models being replaced by new consumer-oriented, market-oriented and technology-oriented models. Digital music has now become a strong consumer favorite.

The music industry, like any other creative industry, is essentially driven by the generation of creative content. It relies on constant development and dissemination of new and innovative works by the key actors in the industry, such as the recording artists, to remain increasingly relevant. Digital technology has led to the democratization of the music market. It has created a more level playing field for the artists, by opening several doors and providing them with new ways to create, distribute and finance their works globally. Naturally, digitization seems to act as a significant stimulator of innovation and creativity in the industry.

However, the ease of copying and sharing files with today's technology seems to alarm content creators. First it was Napster in 1999 that allowed users to share files over the internet, expediting the industry's journey towards the digital sphere. Since then, scores of new P2P file-sharing platforms have cropped up, where millions of songs are shared across the globe. Because the decline in music sales worldwide occurred around the same time that digitization and file-sharing grew widespread, music industry experts have naturally theorized that there exists a causal relationship here. Their theory questions that if music works could be accessed for free, why would one be inclined to pay? Understandably then, what incentives do artists have to continue creating and investing in new works? Under this premise then, the supply of music works, both in terms of quantity and variety, could decline incredibly.

According to various economists (Cammaerts and Meng, 2011; Andersen & Frenz, 2007; Oberholzer-Gee & Strumpf, 2004), however, there are many other critical factors in addition to

[1] **Eindhoven celebrates 50 years of Compact Cassette** retrieved from http://www.philips-museum.com/uk/50-years-of-compact-cassette.html

unauthorized copying that may be the cause of the declining sales (For example the changing consumption patterns and general economic conditions).

Due to the increase in digital copying of files, new business models have been adapted to take complete advantage of what the digital market has to offer. The subsequent shift towards digital distribution to sell and cater to the growing demand, hence, is indicative of the industry's resignation to the consumer preference as well as the acceptance of new innovations and business trends. With digital sales now accounting for over 70% of revenues in the US[2], and with retail giants like iTunes now capturing a major chunk of that market, the picture seems to suggest that in the digital age, a lot of the market power may have merely shifted from the major labels and firms to the digital retailers. Since the traditional business model did not seem to benefit newcomers in the market, this new situation must present different challenges and benefits for new artists and firms looking to enter the digital market.

1.1 Motivation

The music industry and its constant evolution in the digital period has always been a fascinating subject. Throughout the master program, I have been interested in the topics of democratization of technology, digital markets and the role of copyright in these turbulent environments. Particularly, how the music industry structure has transformed, and how the key stakeholders in the industry (the suppliers and creators of music products) are affected by these new changes within the industry has always been of interest. This has compelled me to continuously explore the subject in one form or the other throughout the program, and this thesis provides me with yet another opportunity to critically analyze another aspect of the ever-volatile music industry.

1.2 Objective

This study takes an analytical research approach. By focusing on the US, the world's largest music market, I aim to explore how digitization, with all of its aspects (particularly the rise in digital sales as well as file-sharing) for suppliers affects the extent of newcomers as well as new works by new and existing artists entering the market. A comparison of the period before and after digitization is also made, to see to what extent the supply of product innovation has

[2] Information retrieved from Billboard: http://www.billboard.com/articles/business/6538815/seven-takeaways-from-ifpi-recording-industry-in-numbers

changed. This will provide an insight on whether artists find an incentive to continue producing new works in today's apparently turbulent market.

Thus, the main research question is –

How has digitization impacted product innovation in the US recorded music industry?

The sub questions are –

- Is there a significant change or difference in product innovation in the music industry in the pre- and post-digitization periods?
- How has digitization, with all of its elements for suppliers, affected product innovation in the industry?
- How has digitization affected contestability in the industry?
- How has the unauthorized copying of music files affected the inflow of product innovation in the market?
- Has the introduction of a digital retail system truly resulted in a contestable music market with more innovative works by more new artists?

Handke's (2015) paper on appropriability of creative works as well as the contestability of digital music market in Germany also provides valuable insights on the subject, and will guide me in basing some of my arguments. I will address the above questions by making use of Billboard charts and constructing a dataset for comparison of the pre-digitization period (1990 until 1999) to post-digitization (2000-2014). While several studies have been done in trying to find a relation between piracy and music sales, my focus is on the contestability of the music market (entry of new works and new artists) due to the adoption of digital technologies, both in terms of ease in copying of files and the rise in digital sales, in the music industry. This relationship between digital technology and product innovation in the changing digital ecosystem is an area that has not been completely explored in empirical research. I believe this could add another dimension to the existing study.

1.3 Structure

The remainder of this research is as follows. Chapter two consists of literature review. In this section, related and relevant topics are discussed. Opinions of various economists, as well as journal publications are referred to throughout the chapter, to validate and frame the discussions in relation to the thesis.

The next chapter is dedicated to the research methodology of this thesis. Here, the data, sampling and collection method, the general hypotheses, as well as the exploration of various independent variables that affect the data are presented. The statistical methods used to carry out research is also explained.

Chapter four consists of results acquired from the tests undertaken. Here, the findings and test outputs are presented in the form of tables, graphs and charts to provide a picture of the relationship between the variables examined.

In chapter five, the results are analyzed and discussed, and consistencies or differences with the theories and the results are examined.

Chapter six concludes the thesis, with a discussion of limitations as well as the future scope of the research conducted.

2 Literature Review

This section is divided into six parts. The first part begins with a brief timeline of the recorded music industry in its "analog" form. The second discusses the digital music industry today, with all of its effects and relevant aspects. The third details the impact of digital retailing while the fourth part focuses on product innovation. The fifth is dedicated to an examination of unauthorized copying and copyright effects, while the final part summarizes the entire chapter. Constant references are made to newcomers in the market, which are in indication to both new artists as well as new firms/labels. It's important to note that most new artists tend to start out in the industry either independently, or with independent labels, therefore the emergence/entrance of these labels into the market is equally crucial in the discussion.

2.1 A brief look at the industry timeline

"Take me back to the start" - Coldplay.

Jones (2012) finds the term 'music industry' or the industrialization of music as odd, with one being the "outcome of imagination", and the other "suffused with regimentation". Regardless, literature finds that the recorded music industry came into existence, and rose to prominence in the 20th century, bringing together musicians and businessmen with one common goal – to reap benefits from the music product they had jointly created. It was here that the initial business model of the industry was established – artists performed songs and gave businesses the copyright to their work in exchange of payment, while the businesses sold the recordings of these songs to consumers. Records were considered a profitable investment by the labels, due to their ownership over the product (Jones, 2012). As labels rose to prominence, artists began vying for their attention, to increase their popularity and reach audiences. As the industry grew, so did its music products witness the most technological advances, constantly changing the process of music consumption. During its infancy, music was first released as singles or B-side of the record (Shuker, 2002). With the introduction of long-play (LP), the economic concept of bundling was brought forward, allowing artists to release more songs. The concept of albums was profitable as businesses could charge higher prices for the LPs. Furthermore, economies of scale was attached to albums, as the marketing and distribution costs were lowered.

2.1.1 Majors and Indies

Record labels came to take advantage of their monopoly on the music product, with major industry giants dominating the record industry, similar to an oligopoly, which defined by Krugman et al (2008) is a market structure with only a few producers competing with each other and also possessing market power. The producers in the recorded music industry are basically divided into two groups – the major labels and the independent or indie labels. Majors are "music groups" or international conglomerates that have full control over their activities. Independent labels, on the other hand, are usually the smaller companies that run without the supervision or association with the majors, and tend to distribute their music through alternate channels (AIM, 2015). Menger (2010) states that the oligopolistic market situation of the industry is due to the presence of strong vertical integration in the industry, with the major labels enjoying monopoly over most or all of the manufacturing, recording and publishing facilities, and the well-connected distribution channels. This tends to leave little room for the independent labels. Today, the major conglomerates referred to as the Big Three (started out as the Big Five) - Sony, Universal, and Warner – have progressively built their large empires worldwide, with control of nearly 65% of the global music output (A2IM, 2014).

2.1.2 Market Concentration and Entry Barriers

Naturally, as every level in the value chain is dominated by the major labels, the level of market concentration increases, and the majors tend to secure the largest profit share (Slater et al, 2005). Burke (2011) states that often artists looking to release music on their own tended to be unsuccessful and ended up signing record deals with one of the majors. This shows how the majors were unaffected by any market turbulence. New entrants were restricted even from the highly concentrated distribution networks. Consequently, not only was market contestability restricted in the industry, the variety and newness of music products released was also diminishing. Therefore, low levels of entry were witnessed in this traditional environment. This involved not just fewer new labels, but also a limited number of recording artists (Burke, 2011).

According to Burke (2011) the major labels in the industry tend to benefit from many different economies of scale and scope. First, they can reduce the costs and risks of investing in any artist, because a label's diverse recording artist roster can help them spread out their

investments. Second, the economies of scale in distribution is also seen, as the physical music products are all transported to the same location, leading to a reduction in transport costs. Furthermore, because larger companies are more capable of successful negotiation in terms of prices, they stand at an advantageous position to promote their less popular artists based on their successful artist roster. Additionally, major labels often pick up and sign the artists with these indie labels. In addition to the label's artists, the major labels even end up acquiring the label itself, leading to a horizontal integration. This frequently happens, because these smaller labels do not have access to the same kind of resources as the majors, such as a large and well-connected network, strong financial backing, as well as advanced technical support. Consequently, through these acquisitions and mergers, the majors end up absorbing any competition.

However, major labels tend to function in a bureaucratic manner, which makes it difficult for them to innovate and adapt easily. Naturally, as the music industry structure changed drastically with the introduction of digitization, the industry giants were caught off-guard and unprepared, allowing the newcomers to swoop in and take advantage of the situation.

2.2 Creative Destruction by digitization?

"One of the wonders of the world is going down" – Porcupine Tree.

Digital technology has been directly responsible for the transformation of various industries. Molteni and Ordanini (2003), posit that the dramatic transformation of the framework within which cultural industries have previously existed is due to the very digitization of economies. The recorded music industry too has been affected by these changes, and for the past couple of decades has been involved in the formation of newer strategies and business models that work in the digital scenario. Digital technology has significantly affected not just the physical music product but also the ways in which it is produced, marketed, distributed and consumed. Lam and Tan (2001) state that the easy compression and storage of music in digital format, not to mention the practically effortless dissemination of these files over the internet has

brought endless possibilities for the music industry. With the rise of MP3 in 1995, the traditional CD format was challenged, as a CD could now hold more than 130 songs in the MP3 format (compared to 12, initially). Furthermore, the ease of copying and sharing over the internet, the introduction of CD burners, the developments in broadband technology, and the minimal costs of storage meant that MP3 had become not just economically viable, but also a popular choice (Lam & Tan, 2001). Naturally, this brought a shift in the industry, as it was slowly also diminishing the consumers' demand for physical copies, consequently eliminating the need for a physical supplier. The industry echoed that digital technology was likely to disrupt their working business model. The popularity and extensive use of MP3 also meant that the labels were helpless in fighting the illegal copying of music files, particularly as manufacturers of the copying software would not cooperate with the labels to bring down the activity (Knopper, 2009). This was, of course, merely the tip of the iceberg.

2.2.1 Napster and the aftermath

The biggest impact in the recorded music industry was brought by Napster. In 1999, started as a peer-to-peer file sharing platform, Napster allowed users to indulge in worldwide exchange of music files over the internet, and was a striking representation of the industry's shift towards the digital realm. Napster was disruptive for the industry because music was not a tangible, private good with a specific price anymore. It had become a digital product with public good characteristics, in that it could be easily shared over the internet (SunEagle, 2010).

As Knopper (2009) illustrates, several talks were held between Napster founders and the labels to come to an understanding about the situation and make it profitable for both parties, but it resulted in the labels walking away from a service that potentially offered billions of dollars. According to Knopper (2009) and Giletti (2012), the labels and organizations like RIAA (Recording Industry Association of America) were threatened by this new intervention, and were convinced that file-sharing was leading to copyright infringement, which was damaging to the industry. This consequently led to them suing Napster. The industry believed that file-sharing services would cease to exist post-lawsuit against Napster. But as witnessed, that was not the case. By the time Napster shut down, digital music consumption had become a strong consumer favorite, and several other platforms had cropped. The first stepping stones to the democratization of music had been set. At this point, labels were more concerned with fighting

piracy and less with capitalizing on the new preferred music consumption method. IFPI (2001) reports that in 2000, the US experienced a decline of 1.5% in value, with sales decreasing for the first time from an all-time high in 1999 ($14.9 billion). This was suggested to have been caused by a sharp fall in the sales of the physical copies. The primary reason for this decline was said to be have been the easy availability of tracks for free on the internet.

It was obvious that digital consumption was growing. Apple jumped the bandwagon following the success of digital downloading, and the iTunes Music Store was launched in 2003. This was a digital music store that allowed consumers to legally download music. Thus, as labels missed the opportunity to build a new and possibly profitable distribution channel, Apple managed to dive in and secure a significant share of the digital market instead. As digital music consumption continued to grow and became a consumer favorite, the market was soon accompanied by online streaming services such as Spotify in 2008. Thus, looking back at the incremental transformation of the recorded music industry, it is certain that Napster was instrumental in building the steps to the digital revolution that have led the industry to where it is today.

2.2.2 Market contestability and lowered barriers

The initial high concentration had now scattered, with the introduction of rapid digital technology innovation which allowed new actors into the market and led to a dispersion. The digital market was attractive to jump into, due to lowered costs of production and distribution, bringing down entry barriers and leading to a striking shift of concentration and power (Clemons and Lang, 2003). Consequently, the market was getting more contestable, as the level of concentration was lowering. Nielsen Soundscan (A2IM, 2014) reported that independent labels accounted for 34.6% of music sales in 2013 in the US, jointly outnumbering the revenue share of each individual major label. Due to their generally small size, and the ability to innovate and adapt easily, indie labels were at an advantage when consumer preference shifted from physical to digital music, prompting them to follow their consumers. Thus, democratization of music has been established, through the existence of a virtual market that allows producers and consumers to communicate and trade directly, with little to no barriers. According to Gosain and Lee (2001), this has changed the value chain, and as a consequence, the market and industry structure of the recorded music industry. Today's industry is retreating from the traditional brick and

mortar models and moving towards increasing consumer experience on digital platforms, involving dynamic pricing and lowering information barriers.

2.2.3 Effects on value chain

First, digitization has led to a substantial decline in the production costs for high quality music. As Tschmuck (2003) states, historically, high costs were incurred by labels in the production process in renting recording studios, hiring audio engineers and music equipment, as well as in post-production and mixing. The introduction of low-priced music digital production software and equipment led to a significant reduction in these costs. Inexpensive digital audio workstations like Garageband, Logic and FL Studio incorporate various sound effects, instruments, loops and samples that can be used to create songs with a quality that can compete with studio recordings. As a result, artists can produce musical works on their own, with little external support and investment.

Music distribution too is said to be have been disrupted by digitization, changing the way in which music works are made accessible, and how revenues are generated (Wunsch-Vicent, 2014). Hughes and Lang (2009) illustrate that the major labels enjoyed complete monopoly over the physical objects (CDs and cassettes) and their wide and well-connected distribution networks, and would use the economics of scarcity to their advantage. For new artists today, distributing their work simply means uploading their tracks onto a retailer's or personal website, or even music sites like *Soundcloud* and *Bandcamp*. Often artists upload these tracks for free, with an option for listeners to pay what they want (even zero). This is done merely to spread the word and increase awareness of the artist and their music. To a large extent, then, they are now fairly capable of managing their own careers.

Thus, a shift of power can be seen post-digitization, as digital distribution requires less distribution networks and investments, and is considerably cheaper and easier. The fixed and marginal costs of distribution have decreased, and the reproduction or storage costs have dissipated with digital music. Of course, this is not to say that the digital products have completely eclipsed the market for physical products. CDs and vinyls are still a vital part of the ecology. In fact, today's music market is a synthesis of both traditional and digital models working in the same sphere. However, the new, digital value chain of the industry has been

transformative, in that it has led to various mergers or exit of the big firms, as well as the establishment of smaller, new firms in the music market.

2.3 The digital retail market

"Forget about the price tag" – Jessie J

Digital retail market, therefore, came about as a consequence of this growing preference towards digital consumption. According to Cameron and Bazelon (2013) three big changes have taken place in the traditional distribution model:

1. Digital distribution is inexpensive, and has led to decreasing distribution costs for the industry. Thus, for the artists, the marginal costs of reproducing and distributing their work reduces.
2. Vast music consumption through illegal sources has forced the industry to build or adopt new models that can persuade consumers to opt for legally available music on digital platforms.
3. Unbundling is a reality again, as consumers have the power to download individual songs instead of the full-length albums.

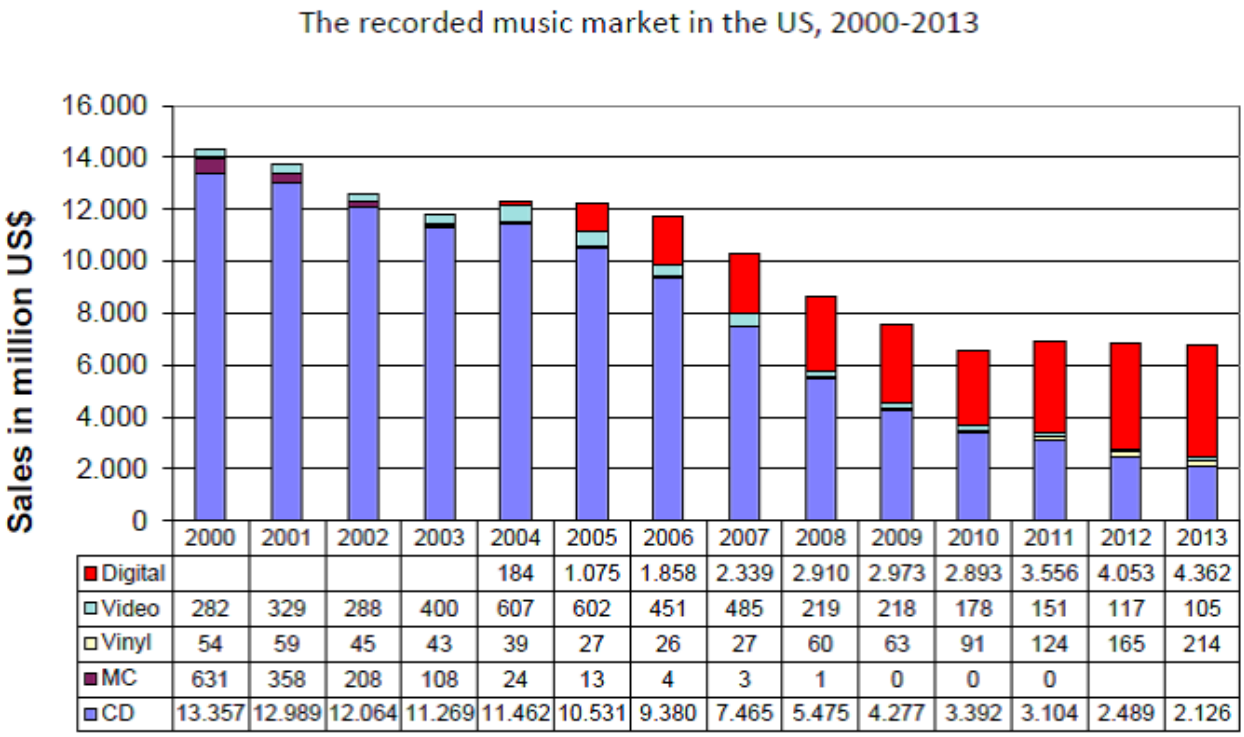
In addition to these, the inventory costs also decrease, enabling any tracks that enter the digital store to have its own shelf life and space. Furthermore, most of the online retail platforms also offer sophisticated recommendation systems, allowing users to check out other similar artists based on their listening/downloading preferences.

2.3.1 Digital market in numbers

As mention earlier, today iTunes is the largest online music retailer in the world[3]. According to the Annual Music Study report by NPD group, it accounted for nearly 63% of the digital market in the US in the fourth quarter of 2012 (Pham, 2013). Thus, iTunes has clearly come to dominate the digital market.

To put all of this information in perspective, by merely looking at the sales figures of RIAA's yearly shipment statistics, one can get a good picture of how digitization has truly shaped the industry.

[3] Information retrieved from Apple.com: Press release http://www.apple.com/pr/library/2008/04/03iTunes-Store-Top-Music-Retailer-in-the-US.html



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Digital					184	1.075	1.858	2.339	2.910	2.973	2.893	3.556	4.053	4.362
Video	282	329	288	400	607	602	451	485	219	218	178	151	117	105
Vinyl	54	59	45	43	39	27	26	27	60	63	91	124	165	214
MC	631	358	208	108	24	13	4	3	1	0	0	0		
CD	13.357	12.989	12.064	11.269	11.462	10.531	9.380	7.465	5.475	4.277	3.392	3.104	2.489	2.126

Source: Based on Recording Industry Association of America (RIAA) data.

Figure 1. The recorded music market in the US, 2000-2013 (RIAA)

While CD album sales accounted for $13 billion in 2000, they declined to a staggering $2 billion in 2013, indicative of a huge drop. Consequently, with the possibility of both unbundling and digital downloading, over the years the digital market has turned into a 'singles' driven market. In the same report, RIAA notes that revenue from singles in this observed period increased to $1.25 billion. At the same time, according to RIAA's 2014 report (2015), streaming music is constantly increasing, as digital downloads decline. Permanent digital downloads fell from $2.8 billion to $2.5 in 2014, while on-demand and streaming music accounted for $1.8 billion, a rise from $1.4 in 2013.

Thus even though digital sales were consistently increasing, the introduction of streaming and subscription based services like Spotify disrupted that growth. In total, however, the digital market accounted for 66% of the total revenues in 2014 for the US industry. Interesting to note, however, that with over a decade of existence, digital sales still haven't managed to secure the peak sales point enjoyed by physical/CD sales in 2000.

2.3.2 Long-tail or tyranny of choice?

Digital market has certainly demonstrated growth in the industry. The impact of all of it on recording artists, however, is less than clear. In relation to digitization, Anderson (2006) introduced the concept of long-tail, which basically theorizes that today's digital economy is increasingly shifting away from a handful of "hits" or superstar products towards a larger number of niches or less popular products.

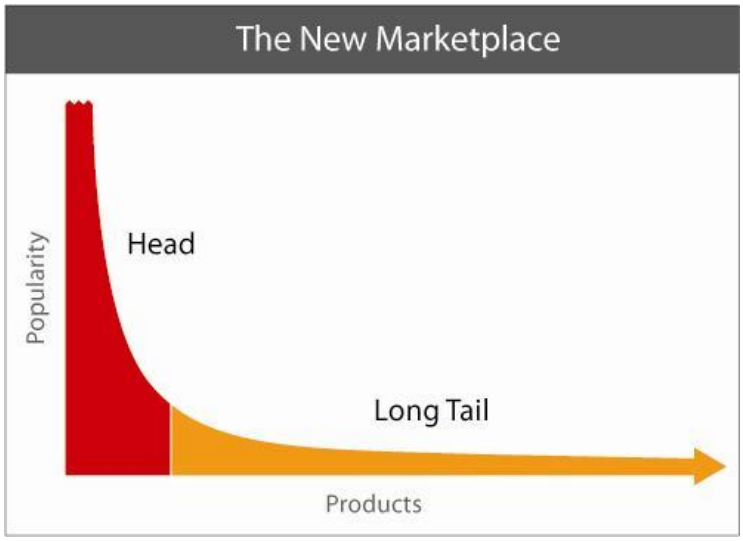


Fig 2. The Long Tail by Anderson (2006) [4]

In relation to the music industry, it implies that unlike in the traditional scenario where physical space in stores was limited and expensive, leading to the CD/cassette stocking of mere hits, online retailers can now stock practically anything, leading to an "infinite shelf space effect". The long-tail, or the millions of niche products with these retailers tend to outnumber the short-head of the hits. This, he finds, is due to the several effects of digitization, a lot of which is very much aligned to what the industry truly witnessed. According to Anderson (2006), first, the production costs decline, which results in the lengthening of the tail as more products are brought onto the market. The diminishing distribution costs due to digitization cause the tail to flatten, allowing the entry of niche products. And finally, as word-of-mouth develops, consumer

[4] Anderson, C [2006] The Long Tail [Online Image] Retrieved May 22, 2015 from http://longtail.typepad.com/the_long_tail/about.html

preference moves from the mainstream hits to the obscure products. Digital technologies give space for product differentiation as a variety of music becomes available to consumers to make informed discovery and purchase choices based on their preferences. Thus, Anderson states that the industry has moved towards a scenario where consumers can go beyond the mainstream hits and easily discover and purchase obscure products pertaining to their preference. To the new or lesser known artists, then, it gives a stage, an access to a broader audience for their music.

While the theory holds some truth, the reality may not be as optimistic. The concept of long-tail and its merit has constantly been challenged. Bhattacharjee et al (2007) in their study on survivability of albums on charts found that the charts are dominated by superstars and the major labels that promote them. More recently in a report by Mulligan (2014) it is stated that the global recorded music industry is in fact a 'superstar economy', in that a small group of recording artists account for a large share of revenues. In his report he finds that over 75% of all artist revenues are acquired by the top 1% of the music products.

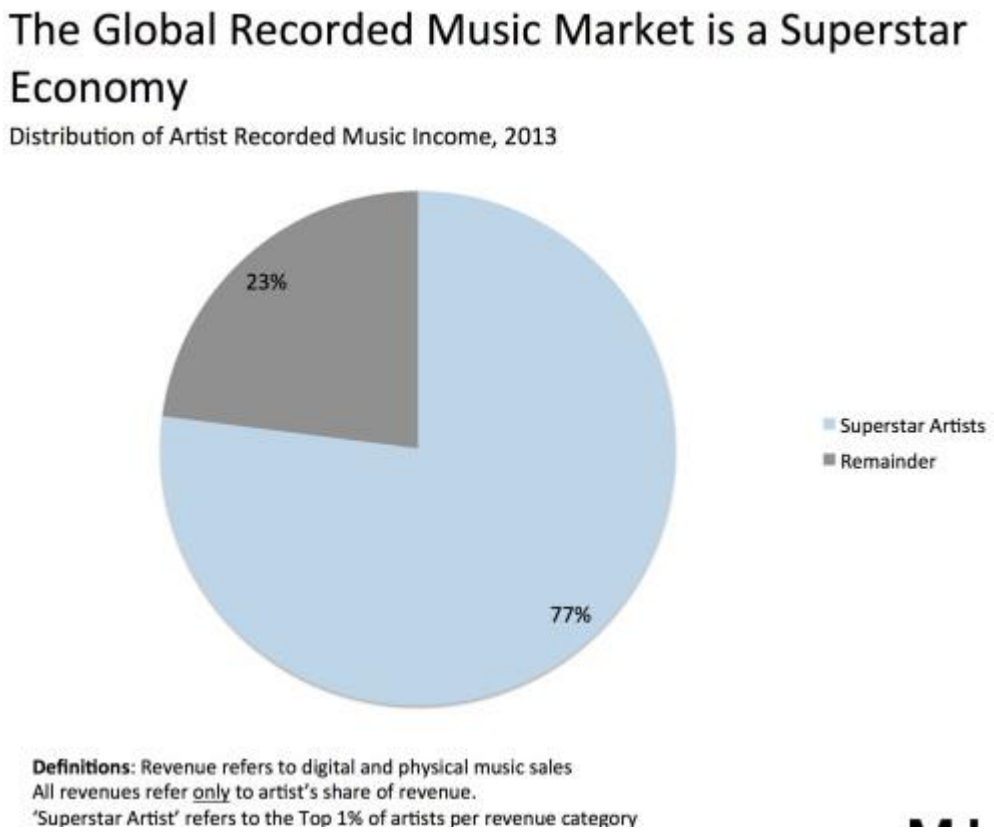


Fig 3. Superstar Economy by Mulligan (2014) [5]

Rosen (1981) argues for the 'phenomenon of superstars' in that established artists tend to supply more to more consumers, consequently taking a greater share of the market. This is verified by Mulligan in his report, and the artist concentration in Fig 2 is reflective of a natural bias towards the hits. He states that this is partially due to the front-end display of selected music products by the digital retailers and streaming services, and partially due to "tyranny of choice". The democratization of music, as mentioned earlier, ideally means access to both music producers and consumers – for artists to produce and distribute more, and for consumers to discover and consume more. As theorized by Anderson, because of everything digital technology has to offer, the larger number of niche products entering the market would be increasingly consumed, which would weaken the Superstar effect.

Ironically, however, the extensive online music shelves and digital catalogues have only added to the confusion of consumers and have led to a tyranny of choice – a situation where too many choices in fact impede discovery and consumption. With digital music libraries growing at the rate of hundred-thousand songs per month, it gets that much more difficult to discover music. "There is so much choice, that there is effectively no choice", notes Mulligan (2014, p. 10). Of course, with any popular music scene there will always be listeners wishing to distinguish themselves from the mainstream or create their musical identity by associating themselves with certain kind of artists and genres. But because of the excess choices, the average consumer tends to rely on the digital music providers, and their recommendation systems to make consumption decisions. And thus in an ironic twist, as these recommendation systems tend to display the top layer of artists or the more mainstream music, the superstar effect intensifies as the amount of music works bringing in the larger revenue share decrease. It should be noted that while popular in discussion, there is very little empirical evidence to support either of the two theories.

[5] Mulligan, M [2014] The Global Recorded Music Market is a Superstar Economy [Online image]. Retrieved May 22, 2014 from http://www.promus.dk

2.4 What is Innovation?

"Harder, Better, Faster, Stronger" – Daft Punk.

Innovation is a diverse, ambiguous term with many definitions for many different classifications. It exists in and varies across several groups and disciplines, each of which define innovation differently. It can be incremental, slowly growing with advancing technology, or it can be completely radical. Some have defined it based on a person, some on a process, and others on a product. There is no universal definition of innovation, much to the discomfort of researchers (Baregheh, Rowley, & Sambrook, 2009). Schumpeter (1942) and Kimberly (1981) have summarized innovation based on its classifications, declaring it to be the introduction of new products, new production methods, or new attributes of organizations. Van de Ven (1986) states that innovation is anything that is perceived to be new to the people that are involved in its creation, even if it is perceived as a copy or imitation by others.

2.4.1 Product Innovation

In general, the terms new, novel, original and improved are often used in literature when defining innovation. It is built on creativity, and creative ideas. Since the concept of 'product innovation' is relevant here, to put the above definitions into perspective and in simpler terms - if a product is new, different, and is preferred over something existing in the past, it can be termed as product innovation. Amabile's (1988) definition of creativity and innovation is that it is "the production of novel and useful ideas by an individual or small groups of individuals working together." This definition aligns perfectly with this research, as it truly describes the notion of product innovation that is discussed above.

Creation of new works is essential in the creative industries. In relation to the music industry, this would imply that product innovation is the creation of new musical works by recording artists. This term is often also interchangeably used with 'content creation', and refers to the investment in new musical works from existing as well as new artists.

2.4.2 Innovation and contestability in the music industry

There is always uncertainty with cultural products like music, as "nobody knows" what the perceived value is of the product (Caves, 2000). However, suppliers of music works indulge

in producing new music due to an expectation of future demand being so positive, that they consider it worthwhile to incur the sunk costs of creation. Often this desire to innovate is driven not just by the expectations of future gains, but also by internal motives.

Incentives to innovate are also related to the market structure. In concentrated markets like the music industry, product differentiation is the key element to set a firm or an artist apart, and eliminate competition. Henderson (1993) explains how larger, incumbent firms have a competitive advantage that allows them to invest more in research and consequently possess more information on the market, the consumers, and the existing as well as potential technology available which can guide any future innovations, all of which is expensive for a newcomer to acquire, making the market less contestable.

However, while major music labels certainly have an edge in terms of large financial resources, economies of scale, as well as decades of experience, they are built as rigid conglomerates with complex organizational structures that take longer to react and adapt to changing demands, and consequently are less likely to innovate. Furthermore, they are constantly competing with aggressive newcomers that bring innovative new products onto the market. Schumpeter (1942) refers to this as "creative destruction", where in a market with high profits, the incumbents competing to capture the largest share of the market are eventually pushed aside by aggressive newcomers, leading to a decline in their market power. At this point, incumbents tend to invest less in more product innovation, and instead rely largely on their superstar artists, as well their back catalogs for revenues.

Newcomers, thus, have a larger incentive to innovate as they have less to lose and more to gain. Digitization has created a shorter supply chain, as well as lowered the production and distribution costs of new products, which encourages new players to intervene. According to Lorenzen and Frederiksen (2005), due to small, indie labels' ability to cater to a niche but demanding market, they are more dedicated towards creating quality content as opposed to oversupplying works. Consequently, their small size, their flexibility in adapting to market situations, as well as their knowledge over their product and their consumers encourages them to consistently invest in new recording artists that produce novel works. Thus, coming back to Schumpeter's theory, contestability, in fact, drives innovation, as newcomers seek to position themselves as different and novel in the market.

It is, however, necessary to note that the likelihood of indie labels to innovate more than majors, while discussed and studied extensively, has not truly been proven in research. There are also just as many qualms about truly contestable markets, and how much of it is a possibility. Mulligan's representation of the artist market also suggests that there may be a higher concentration of the top 1% artists, which leads one to question the competition situation within the industry.

2.5 The effect of unauthorized digital copying

"Just a copy of a copy of a copy" – Nine Inch Nails.

The falling revenues from lowered CD sales in the late 1990s in the US coincided with the rise in P2P file-sharing that allowed illegal music transfers and copying. Naturally, the industry blamed file-sharing for this, claiming loss of revenue due to copyright infringement. Several steps were taken, including suing individual file-sharers, as well as getting internet service providers to cooperate with them in identifying and terminating accounts of file-sharers. Whether or not file-sharing truly affected the industry has led to a lot of discussion. Liebowitz (2006) strongly argues that file-sharing is in fact 'plain destruction', in that, the coinciding decline of sales and birth of file-sharing makes a very straightforward and compelling case in explaining the relationship. The newcomers however were quick to take advantage of the changing scenario, as this industry evolution brought new actors to the forefront. According to a study on German music market by Handke (2006), the growth in indie and new record labels even as music sales declined is rather indicative of a 'creative destruction'.

Copyright is said to encourage creators of information goods to create more, and to allow them to reap sufficient benefits from their creations. Thus, it incentivizes creators to continue providing the society with high-quality information goods. The US Copyright Office (2015) states that copyright is in place "to promote the Progress of Science and useful Arts", implying that it promotes the creation of new works. The important thing to note is that it does not exist to merely generate revenues for owners of copyrighted content, but rather to protect and incentivize them to create and disseminate new works. If looked at fairly, file-sharing does increase the

dissemination of music. Oberholzer and Strumpf (2004) note that file-sharing allows artists to share their music, and allows users to lower their search costs, learn about new music and sample it, which can lead to an increase or decrease in sales depending on their preference.

What has become clear, however, is that copyright protection for music has undoubtedly eroded with the increase in digital copying of files. Cameron and Bazelon (2013) among several economists have classified music as an information good containing the properties of a public good, which implies that it is non-rival and can be non-excludable. This is particularly relevant with digitized music as it can be difficult to exclude end-users and re-users from consuming it. Digitization increases the public good feature of music, while lessening its excludability. Non-excludability enables 'free-riders' to freely access the goods, which is why the copyright system is helping privatize music and diminish its public good property (Handke, 2006). Needless to say, the erosion of copyright protection can affect artists' inclination to enter the market or create new works.

2.5 Summary

In summation, drastic changes have occurred in various functions and business models since the introduction of digitization in the recorded music industry. That much is evident. Digital retailing is a reality now, slowly moving towards capturing a bigger share of the market. Knowing everything we do about digital markets in reference to the theory of long-tail - the ease of entry, a competitive market, more access to resources as well as the cheaper costs of production, reproduction and distribution, endless information and choices for consumers - in an ideal situation, digitization should enable artists to overcome barriers and provide a bigger platform to create and innovate more. Towse (2010) states that anybody can enter the recorded music industry due to low barriers, and create their own products, and as such, copyright does not prevent market contestability. But is that really the situation?

File-sharing too has long been deemed a monster by the industry insiders. According to several experts, as file-sharing increased, consumers had access to free music and were no longer inclined to make purchases anymore. As a result, with the erosion of copyright protection, artists were left vulnerable. So if music could be acquired for free, and the record sales were declining

in general, do artists still have an incentive to continue innovating and creating new works? Is a newcomer still keen on entering the market, when they need not be compensated for their effort?

There are three important considerations here –

One, has digitization, with all of its elements for suppliers actually resulted in a contestable music market with more innovative products?

Two, in the same vein, has digital retailing resulted in more innovative music products and more artists coming into the market?

And three, has the unauthorized copying of music files affected those same variables?

In this research, I aim to find some answers to these questions.

---

3 Research Methodology

Because I'm concerned with the music market in the US for this analysis, for my data collection, I relied primarily on the Billboard Hot 100 charts in pre-digitization (1990-1999) and post-digitization (2000-2014) periods. The Billboard Hot 100 is a reliable weekly music chart for the recorded music industry in the US and has been considered the most conclusive and definitive record of popular music for decades (Rennhoff, 2010). It contains information on the sale of singles as well as radio airplay in a given week, and its main purpose is to track consumption trends and the popularity of the music product. According to Billboard (2015) singles are perfect representations of the market, and are not just responsible for sales or capturing radio airplay, but are also instrumental in stimulating album sales.

3.1 Billboard Hot 100

To provide a little background about the Hot 100[6] - during the very early years, more singles were consumed by listeners, bringing more revenues, and consequently accounting for more weightage in the Hot 100's charting methodology than airplay. However, musicians' gradual shift towards full-length LPs or albums to demonstrate their creativity, caused the record industry to move their focus from singles to album sales. At this point, radio airplay began to carry more weight than sales.

However, because singles were also said to cannibalize album sales in the 1990s, they were slowly being phased out. During this time, songs on the radio were being promoted without being released as singles. Labels were accused of chart manipulation, as they were said to hold off the release of the single until the given song's airplay was at its peak. This was done to enable the song's entry into the top 10, since airplay was accounting for more than the singles sales. Often, after a song had made its debut in the top of the list, labels would delete the single from their catalog, allowing it to slowly decline in the chart as the standalone production sold out in the market. During this time, several songs were not eligible to appear on charts because they were not released as singles. Consequently, Billboard decided to include airplay-only singles in the Hot 100. Thus, Billboard has constantly modified the percentages for weightage in order to accurately track a given song's consumption pattern at a given time (Molanphy, 2013).

[6] Information retrieved and collated from various sessions of 'Ask Billboard' : Billboard.com

3.1.1 Billboard Hot 100 – Methodology

Billboard Hot 100's data is compiled every Monday of a week, and published every Saturday of the consecutive week (Billboard, Billboard Charts Legend, 2015). The way the charts are assembled has changed drastically over the years, and while the singles were assigned ranks based merely on physical sales and radio airplay in the pre-digitization period, digital sales, streaming video and audio data also came to be incorporated in their ranking methodology 2005 onwards (Billboard, 2007). Digital downloads data was incorporated in 2005, whereas audio streaming data was incorporated in 2007, and video streaming data in 2013.

The Hot 100 rely on three main metrics in their charting formula, each accounting for different ratios – radio airplay (30-40%), sales (35-45%), and streaming (20-30%) (Trust, 2013). According to the Billboard Charts legend (2015), Nielsen Music tracks airplay on over 1600 radio stations in the US, which is supplied to Billboard. Online radio data, based on the number of spins from internet services like AOL and Yahoo, are also tracked by the Nielsen Broadcast Data Systems. Digital sales from online retailers like iTunes, as well as physical sales data is acquired on a weekly basis. This includes both the songs downloaded online, as well as the few physical singles sold in retail stores. The sales values are calculated merely for that week, not the total sales since the release of the song. The streaming audio and video data, both "on-demand" and "passive" is tracked through plays on all leading online platforms like Spotify, Rhapsody, Rdio, Youtube, Vevo and more. Eventually, based on these factors, each song is awarded scores on a points system, with larger scores implying higher ranks in the chart.

It is interesting to note that although for decades Billboard Hot 100 accounted for the most popular or "pop" songs in the market, the very nature of pop music seems to be evolving. It's not primarily the same conventional structures and catchy, bubblegum melodies, but rather the appeal and irresistibility of varied and diverse songs all over the different consumption platforms. This is why Billboard Hot 100 is a diverse list, as it tracks popular songs in every genre – from Kendrick Lamar's political commentary on the hiphop track 'King Kunta', to Imagine Dragons' electro-rock ballad 'Radioactive', not to mention the lesser known Indie folk artist Passenger who made it to the top 20 of the charts in 2014[7].

[7] Based on the data collected in this research.

3.2 Data

As discussed before, the inclusion of new recording artists as well as the creation and appearance of new music in the market would be good indicators of product innovation. Thus, in order to examine this, I first created a data set of the top 50 singles appearing on the Billboard Hot 100 chart. I chose systematic random sampling by collecting data for the first week of every March, June, September and December for each year from 1990 to 2014, as random representations for each quarter of the year. Thus, each observation is evenly spaced within the year, and in this way, 25 years with 100 points in time were observed for the variables.

3.2.1 New Singles

Since we are looking at factors influencing new works, in the initial coding process, each song in the top 50 was coded for "new music" in the week. This variable included any new song that appeared for the first time in top 50 in a given week. Thus, every song was coded in the codebook, tracked under the 'new music' variable that was coded 1 for being a new song that week, and 0 otherwise. This category is more inclusive, as it contained new music works by both established, as well as new and emerging artists.

3.2.2 New Artists

In a similar process, another variable I created was "new artists", which included any new artist that entered the top 50 in a given week with their first single. This is a more exclusive category, as it only included artists who made their debut into the charts with that particular single. For this category as well, I coded the top 50 of the Billboard Hot 100, where the 'new artists' were established based merely on their first ever appearance in the charts, (irrespective of when their musical career began, since often artists reach popular charts with their second or third singles/albums). This data was cross-checked with each artist's page on Billboard. It helped determine whether it was their first single to hit the charts that particular week, and was done to observe how often newcomers get a break in the market. This variable too, in similar fashion, was coded for 100 points in time, or 25 annual observations.

3.3 Independent variables

3.3.1 Presence of labels in the charts

In addition to this, for each song in the top 50 each week, I also coded the music label it was released on, and whether it was an indie or a major label. The association with labels, particularly majors, could prove to be a measure influencing the presence of new works in the charts, since as discussed before, majors possess more resources in getting more airplay and shelf-life for their artists. Furthermore, the presence or the share of indies and newcomers in the top 50 could also be determined with this process. To ascertain the label for each song, hence, I made use of artist pages on Billboard, the artist's website, as well as *Discogs* which is a music database containing information of over 5.5 million releases worldwide.

The important thing to note about the classification of major and indie labels is the boundary and definition assigned to both. Association of Independent Music (AIM) defines a major label as one which is a large, multinational conglomerate, usually with control over publishing, manufacturing as well as distribution activities. It also tends to capture over 5% of the global music sales. Indies, on the other hands, are labels that operate without any association with the majors. According to AIM "If a major owns 50% or more of the total shares in your company, you would (usually) be owned or controlled by that major." Thus, there are two ways of looking at labels when determining market share - label ownership and distribution ownership.

Most indies tend to have distribution deals with majors for physical sales which is also usually considered by recording industry organizations like IFPI, RIAA, Nielsen Soundscan when determining market share data. However, for my classification here, I shall consider label ownership to distinguish between both groups. Therefore, if the song is released under a label with no attachments to a major label (except distribution), it would qualify as being released under an indie label. Thus, for each of the coded songs every week, I looked up the label it was released on in the US, on both the websites *Wikipedia* and *Discogs*. Because this is a time-series, and ownership of labels continue to change over years, each label was marked according to that particular observation time's ownership and coded into two groups –1 for majors and 0 for indies. For example, Island Records functioned as an indie label until 1997 and was subsequently acquired by major label EMI, which was later acquired by Universal, and is therefore coded as 0 for all observations until 1997, and 1 since then. The assumption with this variable would be that

an association with major label leads to more appearances in the charts in terms of new music and for new artists. The null hypothesis, hence, is that there is no relation.

3.3.2 Digital sales

The other important variables I considered as factors influencing the presence of innovation in charts were the digital market share of US in its overall music sales, as well as the digital market share of singles of US for years 2003-2014. This data may prove relevant in how the digital market affects the appearance of new music works. The data for each of the years was collected from year-end digital music industry reports of both RIAA and Nielsen Soundscan. Both organizations report figures on physical and digital sales, as well as a time-series of the music market in US. Although the digital period I refer to here begins from 2000, the organizations only begin reporting on digital sales from the year iTunes became available across all operating systems (2003). The assumption with these variables would be that with rising digital revenues, the appearance of new works and artists should ideally increase.

3.3.3 Unauthorized copying

Finally, as an indicator of copyright strength, I tried to acquire data on music file sharing from NPD's "Annual music study" that conducts yearly consumer surveys on illegal downloads. However, because the information for several years was not made available (2000-2003), as well as the most recent year (2014), it prevented me from including the numbers and instead I took the most primitive approach by creating a dummy variable for unauthorized copying. Thus, for the years 1990-1999 were coded as '0' to indicate virtually no copying, and the years 2000-2014 were coded as '1' to indicate the offset plus continual copying activity. Industry experts have, time and again, theoretically found links between the falling music market revenues and music piracy, with little empirical evidence to support the claims (Cochrane, 2011). Naturally, this variable may not give the most perfect results but would provide with an indication as to whether there is a relation between this variable and the creation of new music. The assumption would be that illegal digital copying decreases the flow of new works and new artists into the market.

3.4 Statistical methods

I have used different models to run various analyses, with the help of SPSS, the statistical software. First, to make a proper comparison of the two periods, I divided the timeline into two groups (pre- and post-digital). This was done through the creation of a dummy variable, with 0s for the pre-digitization period (1990-1999), and 1s for the post digitization period (2000-2014). Then, two independent T-tests were conducted for both the dependent variables – new music and new artists - with this dummy variable for time. I present this in the next section, along with an illustration of the results for the data collected for new works and new artists.

This is followed by two simple OLS regression tests for both dependent variables, regressed against the main explanatory variable "year" – again, to observe how good the variable is in predicting the dependent variables, i.e, have new works and new artists increased in the digital age. A final multiple regression analysis follows, to find a correlation/relationship between all of the independent variables (years/time, sale of digital singles, unauthorized copying as well as the presence of major labels in the chart) and the flow of new music and new artists in the charts over time.

4 Results

4.1 New Singles appearing in the top 50 of Billboard Hot 100 (1990-2014)

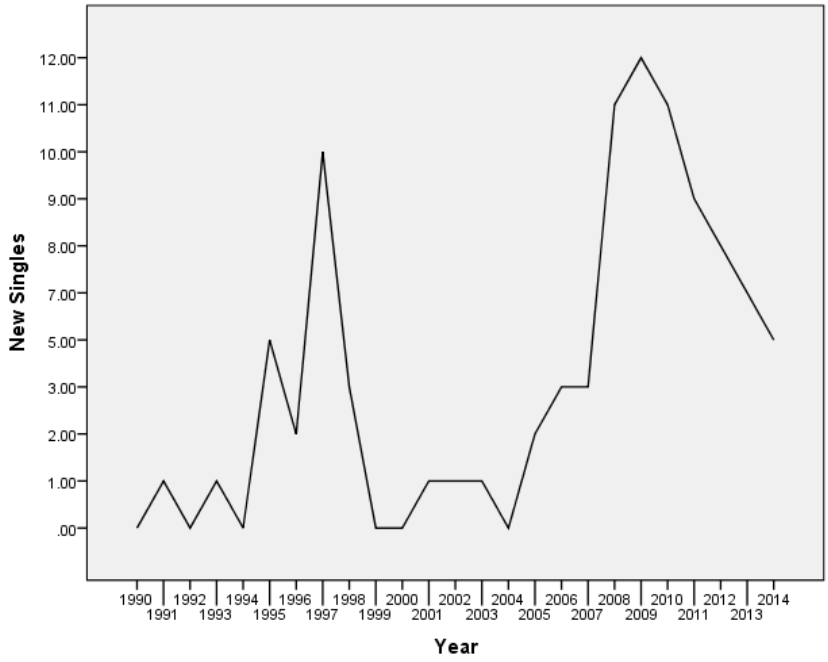


Fig 4. New Singles in the top 50 of Billboard Hot 100 from 1990 to 2014.

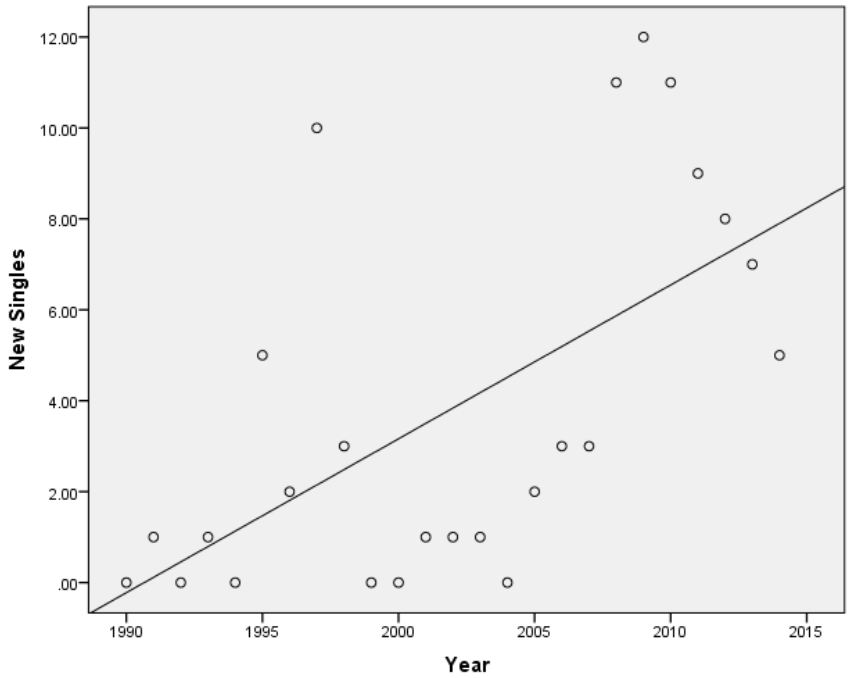


Fig 5. New singles from 1990-2014 with a fit line.

On face value, the turbulence in the charts is rather stark, and the trend and variation seems fairly obvious. There is a general downward trend in the entire picture, starting with a lower trend in pre-digitization period (1990-1999), with one spike in 1997. The upward trend post-digitization too is quite striking, and even though the number of new works is generally higher in the digital age, a clear downward trend is visible even in the digital period. Interestingly, the falling trend is more pronounced in the pre-digitization period, rather than in the years right after Napster's introduction. Based on Fig 4, the regression line is, at best, a moderate fit, i.e, there is a positive but moderate correlation between the two variables.

Descriptives: New Singles

	New Singles		
	N	**Mean**	**S.D**
Pre-digitization period (1990-1999)	10	2.2	3.19
Post-digitization period (2000-2014)	15	4.93	4.35
Total	25	3.84	4.08

Table 1. Descriptives of New Singles category for pre-digitization and post-digitization periods.

An independent-sample t-test was conducted to compare the number of new singles appearing in the pre- and post-digitization periods. The scores for pre-digitization (M = 2.2, SD= 3.19) and post-digitization (M = 4.93, SD= 4.35) periods; with equal variance not assumed (t23) = -1.810, p = 0.083* [8] illustrate a trend towards a significant difference in the means of two groups, and therefore between the appearance of new music in the pre- and post-digitization periods. However, it would be premature to confidently state that the greater average in the digitization period is sustainable.

[8] *p < 0.1; **p < 0.05

4.2 New Artists appearing in the top 50 of Billboard Hot 100 (1990-2014)

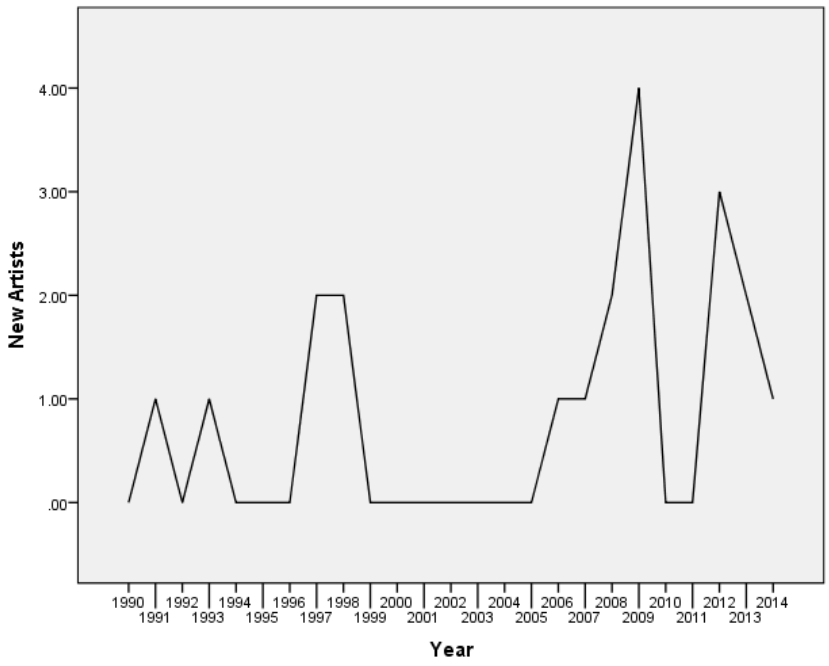


Fig 6. New Artists in the top 50 of Billboard Hot 100 from 1990 to 2014.

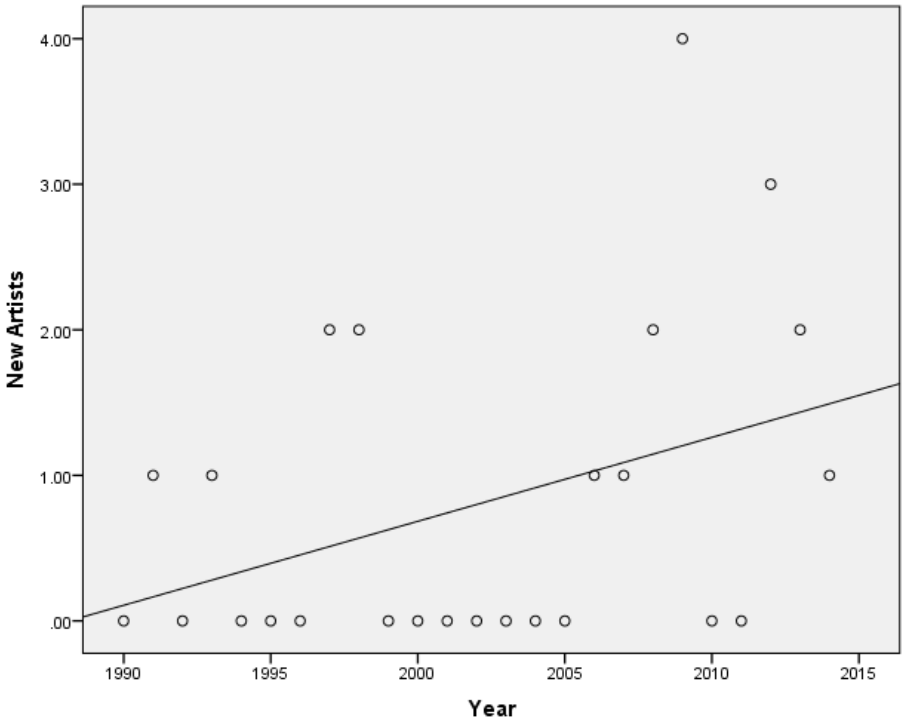


Fig 7. New singles from 1990-2014 with a fit line.

For this category, very few observations were made of new artists appearing in the selected weeks in Top 50 of the charts from 1990 to 2014 – a total of 20. This is even more erratic, compared to the new singles. Similar to the New Singles category, based on the trend line, more new artists make an appearance in the charts in the second half of the post-digitization period, compared to those in the pre-digitization period. This is reaffirmed by Billboard as R&B artist Chris Brown, for example, was the first male artist to hit the charts with a debut single in 2005 after nearly a decade (P. Diddy in 1997)[9]. However, the regression line is not a good fit with this data, i.e, there is a weak correlation.

Descriptives: New Artists

	New Artists		
	N	**Mean**	**S.D**
Pre-digitization period (1990-1999)	10	0.6	0.84
Post-digitization period (2000-2014)	15	0.93	1.27
Total	25	0.8	1.11

Table 2. Descriptives of New Artists category for pre-digitization and post-digitization periods.

The general trend based on this data is also downward. Based on the independent t-test scores for pre-digitization (M = 0.60, SD= 0.84) and post-digitization (M = 0.93, SD= 1.27); with (t23) = -0.785, p = 0.44 as well as on the low number of observations, it can be said that there is no significant difference between the means of both periods, and thus, no difference in the appearance of new artists in the pre- and post-digitization periods.

[9] Information retrieved from Billboard: Chris Brown - Biography https://www.billboard.com/artist/1486846/chris-brown/biography

4.3 OLS Regression

Coefficients: New Singles and New Artists + Years				
	New Singles		New Artists	
	B	**SE**	**B**	**SE**
Constant	-673.76	183.953	-114.7	58.664
Years (1990-2014)	0.338 (0.001 ****)	0.092	0.058 (0.061 *)	0.029
R^2	0.371		0.144	

Table 3. Regression of both dependent variables against main explanatory variable 'Years'.

B = unstandardized coefficient, SE = Standard error, **** $p \leq 0.001$; * $p \leq 0.1$

To identify if the introduction of digital technology in the market offset more works coming into the market in the following years in comparison to the previous period, I further conducted a simple linear regression. Thus, this was done to observe how effective and significant the continuous independent variable (year) was in predicting the turbulence in charts, as well as the direction of this relationship. From the above result, it is clear that there exists a very positive relationship between time and the number of singles appearing in the charts (B=0.338), and the effect is extremely significant statistically (p=0.001 ****), implying that time may be a good factor in predicting the new singles appearance. Thus, based on this relationship it is safe to say that with increasing years, the number of new singles produced have increased.

Similarly, for the new artist category, a simple regression notes that there is a positive relationship between the years and the dependent variable (B=0.058), and that the result is approaching towards statistical significance (p=.061*), implying that the independent variable time (years) may be a somewhat good predictor for the appearance of new artists in the charts, i.e, with increasing years, the number of new artists in the charts may have increased.

To draw some more discussions from the analysis, based on the net effect of the results of both New Singles and New Artists, it is evident that the number of new artists is not keeping pace with the increase in new music coming into the charts. Since the New Artists category is

more exclusive, whereas the New Singles category includes works from new and existing artists, it could be safe to say that the number of new artists is increasing at a declining rate, compared to the increase in more works by existing artists.

4.3 Finding Correlation – Turbulence in the charts, time, illegal downloading, major labels and digital sales.

To find a relationship between the dependent variables (new music and new artists) and the independent variables I began with a basic linear regression analysis on SPSS. In this case, time is a regressor, therefore, both dependent variables were regressed against the continuous independent variable – year (representing both pre- and post-digitization periods). I then introduced the dummy variable for copying, the presence of major labels in the charts, as well as the share of digital singles into the model. The digital market share of US was omitted from the model due to the problem of collinearity with the digital singles share variable. A dummy variable was created and 00s were entered for both digital singles sales and illegal internet downloading in the pre-digitization period. For both the dependent variables, I had quarterly observations from 1990-2014, thus, 4 points in time each year, or 25 annual observations each. Table 4 presents the regression results using both the dependent variables.

Coefficients: New Singles and New Artists				
	New Singles		New Artists	
Predictors	**B**	**SE**	**B**	**SE**
Step 1				
Constant	-0.56	1.366	0.5	0.436
Years (1990-2014)	0.338 (0.001 ****)	0.092	0.58 (0.061 *)	0.029
Step 2				
Constant	-2.287 (.68)	15.024	0.076 (.7)	5.335
Years (1990-2014)	0.121 (.69)	0.302	0.041 (.7)	0.107
Unauthorized copying (Dummy variable)	-2.729 (.3)	2.598	-0.885 (.34)	0.923
Share of digital singles (in Million Units)	5.061 (0.088 *)	2.093	0.911 (.37)	1.001
Presence of Major Labels in the Charts (In Hundreds)	0.022 (.8)	0.09	0.002 (.95)	0.032
R^2	0.58		0.295	

Table 3. Regression coefficients of both DVs against IVs.

B = unstandardized coefficient, SE = Standard error, P-values in parenthesis; **** $p \leq 0.001$; * $p \leq 0.1$

Before the results are discussed - this analysis is based on a rather small sample, and the data for both the dependent variables is not normally distributed with a few outliers, nor is the data stationary. Furthermore, based on the collinearity test[10], it is evident that in spite of the removal of the independent variable for Total digital sales, there is still a problem of collinearity in the model. Thus, there is indeed ambiguity in the interpretation of these results and any such interpretation must be done with caution.

[10] Condition Index – 3001.7 highly associated with IV "Years" (1.00).

It is noticeable that the regression results are not perfectly robust or statistically significant for both the dependent variables[11]. Based on the regression analysis results for New Singles, none of the independent variables have led to a statistically significant result except for the digital market share of singles in the US, (p = 0.08*, significant at 10%). Thus, holding all else constant, changes in the number of digital singles sold is somewhat related to the changes in the number of new singles that appear in the charts. To simplify, a one unit (in this case, million units) increase in digital sales may lead to a 5.06 increase in new music in the charts in this sample.

To put the numbers in perspective with the New Music estimates for digital single sales - since a positive relation exists, and considering that the single sales have risen the digital period, if we multiply this coefficient (5.08) by the $1.28 million unit increase in digital single sales observed from 2003 to 2014, this indicates that nearly 6.47 new songs enter the top 50 of the Hot 100 annually. Looking at Fig 3 and 4, while all else is not held constant, this information is more or less consistent with the data plotted.

Interestingly, of all the insignificant relationships, the dummy variable representing unauthorized copying shows that it is not a significant predictor for both new music and new artists appearing in the charts. This indicates that there appears to be no relation between them, and that the inflow in the charts with regards to new creations or new artists is not directly impacted by the digital copying of music files.

Of the association with labels coded for each song in the charts, every year the majors on an average accounted for nearly 180 of the 200 songs coded (Top 50 per quarter). That's 90% of the top 50 market in this sample dominated by the major labels. However, based on the results, the association with a major label does not correlate, and therefore, does not seem to strongly affect the appearance of new songs and new artists.

Similarly, in terms of years, although time was a good predictor in the first regression model, based on the addition of other factors in the second model's multiple regression, it can be said that time is a good predictor without controlling for other variables. However, the inclusion of other variables does not increase the predictability of the outcomes.

[11] When regressed individually, each variable displayed varying levels of significance. Just for New Singles: Digital Single Sales (0.001****), Major Labels (0.5 **), Copying Dummy (0.1 *).

The effect size was also calculated for new singles, as a way to ascertain the size of association or difference in the data. Based on the effect size as calculated by Cohen's f^2 ($f^2 = \frac{R^2}{1-R^2} = \frac{SS_{Reg}}{SS_{Res}}$ with R^2 being 0.58) is 1.39, which is described as being a large effect. The effect size for new artists with R^2 being 0.29 was 0.40, which is a very small effect.

There may be several reasons for the negative correlations presented here. One possibility may be that because both dependent variables present a general downward trend, when regressed with an increasing variable like 'years' holding all else constant, it shows up as a negative correlation. Perhaps the correlation is in fact there, but is invisible, as it is affected by the falling trend.

Overall, however, even though the digital single sales are a somewhat good predictor, and while the overall model does possess some predictive effect on the data, since both the observed variables do not offer correlation, and are consistent with both positive and negative relationships, as such, the hypothesis that digitization makes the market more contestable cannot be confidently accepted. This shall be discussed in the next section.

---

5 Discussion

Putting the above analysis in context, the following results were determined:

- The main hypothesis that digitization brings more product innovation and makes the market more contestable cannot be confidently accepted.
- Based on the sample, the inflow of new music (not holding all else constant) has increased marginally in the post-digitization period, compared to the previous period.
- There is a general downward trend in both the appearance of new music and new artists.
- The appearance of new artists is increasing at a declining rate, compared to the inclusion of new songs in the charts.
- Based on the data, there is no evidence to support the impact of unauthorized copying on music output.
- The association of major labels in relation to the presence of new works and new artists in the charts cannot be determined based on the sample.
- Digital sales display a somewhat positive relation to the increase of new singles in the charts, but not with the appearance of new artists.

5.1 Impact of Copying

As theory posits, unauthorized copying would likely have a negative effect on revenues, and consequently on the supply of more works and more artists entering the market. However the result here, finding no significant correlation between the two, is consistent with several findings on the impact of file-sharing and copying in the industry. Handke (2012) has found no significant evidence of copying impacting the inflow of new music works in the German record industry. If anything, the supply of new music has only expanded over the years. File-sharing is even said to positively impact producers, as music albums shared over networks survived longer in the Billboard charts (Bhattacharjee et al, 2007). Therefore, based on this study too, unauthorized copying has little impact on the industry at least in terms of product innovation and creation.

In an ideal situation, with the promise of an accessible market with digital technology at hand, more innovation and creative content ought to materialize. Lowered barriers, as well as

lowered costs of creation and distribution would lead to larger dissemination of works, and more profitable gains for artists and suppliers of music works. Naturally, it ought to lead to positive chain, with artists motivated to produce more works or to enter the market with the prospect of significant gains, eventually resulting in a very contestable market.

The reality, however, may not be as positive. There may be several reasons for why the digital music market is not getting more contestable with time.

5.2 Factors affecting innovation and contestability

5.2.1 Chart assembling

Since innovation in this research is portrayed by the Billboard Hot 100, and since the appearance into these charts act as a proxy for market entry, the way in which Billboard's chart is assembled alone plays an important factor in explaining the trends. Since the introduction of digital sales in the charts from 2005, the sales of digital downloads on an average have more than doubled. Just as the fall of single sales pre-digitization led to more importance towards airplay in the charts, the increase of digital sales have led to a bigger influence on what shows up on the charts. Furthermore, in the earlier years, songs had to be Airplay-only, to make an appearance in the Hot 100, i.e, songs had to be released on physical formats and consequently play on the radio to be included. Now, tracks can feature in the Hot 100 regardless of possessing physical component or their ranking in the airplay charts. This is because the ratio assigned to digital sales and on-demand music to arrive at the ranks is constantly increasing. The Hot 100, Billboard states, have become download-driven. Seeing as how neither of those two promotion/sales format seem to favor the newcomers (airplay and downloads), there is little doubt as to why the charts do not represent more new works from new recording artists.

5.2.2 The effect on labels

In the past decade, based on the reports by A2IM and AIM, the indie market is certainly flourishing, with the number of labels constantly increasing. Some of these labels in the market have also been successful in promoting their artists to the top of Billboard Hot 100 charts. Popular artists signed to indie labels, such as Adele and Taylor Swift, have significantly contributed to a rise in the market share of indies over the years. Seeing as how distribution costs diminish with digital technology, this is not a surprising observation.

The association with labels does not seem to be a good predictor of the supply of new works and new artists in this study and that may, in fact, be because not all barriers have been broken with digitization. Labels rely largely on the digital market leaders for their distribution. Very few indie firms or recording artists that have developed their own cult following, for example the London based *Erased Tapes Records* or rock band *Radiohead* have managed to successfully sell their works online. More often than not, the digital retailers are a largely present mediator for the labels, both major and indie. This may simply be due to growing consumer preference or the fact that none of the other retailing initiatives taken by the major labels worked[12]. Thus, even though digitization promises a democratized market with free access, it has merely shifted the control on distribution from the hands of major labels to new intermediaries instead. As a result, there are some constraints on major labels, as well as limits on the reach of indie labels that supply newer, lesser known products. This is discussed in detail in the next part.

5.2.3 Retail market

Since its inception in 2003, the iTunes store has led to the proliferation of digital retail. Today, since iTunes takes the largest share of the digital market, the sales from the store naturally have an influence in determining chart performance. For several years, artist Kid Rock had decided to withhold his releases from the iTunes store, choosing to release only on physical format. However, in 2008, when consumers could not purchase Kid Rock's popular song '*All Summer Long*' online, a karaoke company Hit Masters' karaoke version of the song which was released on iTunes, ended up overtaking the original song in the Hot 100, peaking at 19 (Billboard, 2008). Kid Rock has, since then, adopted iTunes.

Another example is that of pop artist Fergie's 'Glamorous' that consistently made leaps in the charts. After soaring to top ten in 2007, the track quickly fell below the top 50. However, soon after being released on iTunes, the song shot back up in the top 10 again (Billboard, 2007). It is practically undeniable, the effect one retail behemoth, has on the turbulence of charts. However, what this means for new works and artists is another debate.

[12] "MusicNet started in early 2001 with the EMI, Warner, and BMG catalogs, while Sony and Universal started the very similar service Pressplay." Information retrieved from Pitchfork: http://pitchfork.com/features/cover-story/reader/streaming/

DIGITAL ALBUMS

	2014	2013	% CHG.
CURRENT	52.9	62.3	*-15.1%*
CATALOG	53.6	55.3	*-3.1%*

DIGITAL TRACKS

	2014	2013	% CHG.
CURRENT	532.9	593.8	*-10.3%*
CATALOG	569.6	665.6	*-14.4%*

Fig 8. Current and Catalog sales on Digital Platforms (Nielsen, 2014)[13].

Simply based on the figures above, it is clear that a big portion of the digital works sold are tracks and albums from the back catalog. Seeing as how the majors and larger firms have clearly come to acquire a significant amount of catalog works particularly due to their own long history, as well as the acquisition of other firms, they rely heavily on these sales than investing in new works and artists. As mentioned before, since new firms tend to compete in the market by producing innovative products, they clearly do not possess the benefit provided by catalogs. Handke (2015) describes this effect as "competing with the past", wherein incumbents possess such an edge over the newcomers, disrupting the possibility of competition.

As an example, in 2012, 90s pop artist Whitney Houston's greatest hits were re-released as digital singles. In this data sample for the first week of March in 2012, four of those singles had made it to the Top 50 for that week, due to gains in digital sales. Therefore, when considering the fact that catalog works essentially replace new works, it makes it difficult for newcomers (both firms and artists) to compete, leading to lesser new appearances by new artists, and lesser new music works.

[13] Report retrieved from Nielsen.com - http://www.nielsen.com/content/dam/corporate/us/en/public%20factsheets/Soundscan/nielsen-2014-year-end-music-report-us.pdf

5.2.4 An industry of superstars?

All of it seems to trickles down to simple economics - abundance in one area is likely to increase scarcity in others. This research's result on low contestability and innovation with more digitization, hence, tends towards the alternative to the long-tail hypothesis. As stated by Mulligan (2014), there has always been a tendency towards a 'superstar economy' in the recorded music industry, with the well-established artists enjoying more market power. According to Bourreau, Gensollen and Moreau (2008), although theoretically, the digital music market enables free entry to all, very few artists tend to benefit from the distribution and promotion required to reach larger audiences. This is because these activities are often centralized. Usually, consumers do not possess the high capacity to consume large quantities of information to fully benefit from the diversity today's digital music market may offer. Thus, with products and content available to users in abundance, relying on recommendation and filtered information leads to value creation. The supply and demand of music only interact in the presence of catalysts in the music market, who appear in the form of recommendation systems or gatekeepers, and conduct the tasks of curating what is heard and consumed, and how.

Curation or recommendation is not a new concept in the music industry. The new recommendation systems shaping music tastes might seem futuristic, but radio airplay has essentially done just that for decades. Because the majority of listeners are passive listeners, they tend to consume what is given to them, rather than discover new music on their own. Thus, the road to music discovery is in fact hindered by the vast and growing digital catalog that adds to the confusion of the average user, leading them to rely on online recommendation systems. However, it is this discovery that builds the stepping stones towards success for new artists, which is often affected by the way online stores promote works. It is known that digital stores have limited space on their webpage to display what is an increasingly vast catalog of digital works. Naturally, even with an infinite shelf space and "genius" recommendation systems that help discover new music on these digital platforms, there is a natural bias towards the top 1% or mainstream artists that usually end up on display.

According to Billboard (2015), iTunes's general recommendation system on each page, or the 'carousel' system, has been replaced from being handpicked by experts and editorial staff to being driven by sales. As a result, this gives superstars an edge over indie recording artists, as they would not oversell the mainstream artists. The handful of new artists appearing in the

Billboard Hot 100 in this data sample may in fact be indicative of this phenomenon on the online store.

In addition, let's also not forget the other examples that portray the unfavorable situation for new artists, such as the antithesis of Spotify, i.e, Forgotify.com, a collection of 4 million and up songs that have never been played on the streaming service. Bhattacharjee et al.'s (2007) results also emphasize that albums promoted by major labels, as well as albums of superstars tend to survive longer in the charts. Naturally then, as the top artists get more airplay, prominent space on digital stores, as well as support and promotion from all the nationally televised music award ceremonies, giving them a larger revenue share. Thus, the little evidence of the long-tail theory in support of newcomers does not truly come as a surprise.

To be fair, digital technologies have undoubtedly lowered the level of investment needed today to produce, distribute and promote music works. But the concept of 'winner-takes-all' (Caves, 2000) is still very much present in the music industry, with 10% products bringing in 90% of the revenues (as an example). As also reported in this research, the digital market may have had a somewhat significant impact in the creation of new works (by existing artists), but there is no evidence of an impact on the supply of new artists. There may be many more reasons, in addition to the ones mentioned above, as to why the market does not bring the promise of a democratized situation for all. The general downward trend of new artists coming into the charts, along with the increasing market power of digital retailers may be indicative that today's digital music market is not completely favorable for newcomers.

6 Conclusion

In this study, the effect of digitization in the form of digital sales and unauthorized copying was observed on the growth of product innovation in the form of new music works and new artists in the recorded music industry. This was done by observing the Billboard Hot 100, and regressing the observed data against the explanatory variables of time, digital singles sale values, association with major label, and the effect of unauthorized copying (dummy). The research has been limited by several factors: the data sample, while covering several points in time, only consists of 25 years. Furthermore, very few observations were made for both the dependent variables in each point, leading to less than robust results. The lack of reliable or publicly available data for file-sharing/illegal downloading of music for the US has been a hindrance for this research. The regression results may also have been affected by the problem of collinearity as well as the general downward trend of the data which was not accounted for.

Based on the results three clear conclusions were made:

1. The recorded music market is not getting more innovative and contestable with time.
2. Digital retailing may be supporting existing artists more than newcomers.
3. Unauthorized copying of music files shows no impact on product innovation.

Thus, when looked at from a broader perspective – even if we accept that the billions of dollars decline in record sales in the US, as reported by RIAA in Fig.1, was caused by file-sharing, it can also be concluded that the unauthorized copying of music files has not led to the creation of less new music, or the inflow of new artists into the market. Based on existing research, the ease of sharing works tends to favor artists' survivability in the charts. Furthermore, if we take the somewhat positive correlation between digital sales and appearance of new singles in the charts, one could infer that the creation of new music did not decrease with the declining industry revenues. This is an interesting observation, because if the market situation is as turbulent as described by industry insiders, declining annual revenues should lead to lesser music coming into the market. But based merely on these results, the opposite is true. Existing artists have continued to produce more new works in the market.

It is also indicated from the regression results, that even though new singles appearing in the market may be increasing with digital sales, it is not the case with new artists. Thus, something in the way the digital market functions seems to support the increase in works by

existing artists, but does not provide equal ground to new artists. As discussed, this may be the due to the presence of a superstar economy with both major labels as well as their superstar artists controlling a larger share of the market.

Digital market has become increasingly important, and artists as well as labels are now increasingly dependent on the digital intermediaries to sell their works. Platforms like iTunes capitalized on the shift towards digital consumption and with the declining general revenues in the industry, captured a valuable stream of income for themselves. These retailers possess a lot of market power and are in the position to dictate what gets heard and when. As discussed in 2.1.2, when market concentration increases, the barriers keep the keen competitors out, and the winner-takes-all. This is also discussed by Handke (2015) who finds no evidence of online retailers fostering competition between creators. Naturally, this affects innovation within the industry which is problematic, because innovation is a driving force of any creative environment.

As is always the case, there is a lot left unanswered. While effort has been made to fit and understand some of the depths of the recorded music industry in 40 pages, it is based on perspectives from the outside. It is always difficult to run controlled experiments when the internal intricacies and details of any industry or market are not known. Therefore, it is difficult to draw strong, generalized statements from the data and the results. However, what this study has tried to do is merely bring another perspective on the table, and understand certain phenomena within the industry using the tools of economics and statistics at hand. The aim in this paper was not to make unauthorized copying a hero, and demonize digital retailers. Rather, it is to help move the constant debate over the harmful effects of copying, to more pressing concerns for the music industry. Digital distribution is a very powerful tool for artists and labels today and does provide opportunities to trade. However, in its current state, it is not very conducive for the development of a contestable market.

A way of changing that needs to come internally within the market. Billboard's new "Emerging Artists" chart that began in mid-2014 is a daily compilation of artists with low sales and low number of followers on social networking sites, but greater buzz and 'shares' on Twitter and Facebook. Perhaps an integration of this can be done with retailers, to turn this buzz into stimulating sales. Care must be taken to make the digital situation favorable for new as well as

existing artists, or it simply leads to a full circle of what the industry has already witnessed in the years past.

The ever changing and turbulent nature of the digital market implies that there is always scope for more. The study of copyright infringement never stops, and any additional empirical work on the subject can only help policymakers make sophisticated decisions to revise the laws of copyright in the music industry. A broader study on the impact of digital distribution on the balance between the different stakeholders also ought to be explored. Today, streaming has become the "hot" thing, and is reported to slowly cannibalize digital sales. Further empirical and theoretical studies can be done to assess this market situation. The extent and impact of the 'superstar economy' is another dimension that needs to be explored more. Since the global music industry is witnessing a revolution with digital technology, it would be just as fascinating to see if this study could be replicated with data from other countries, as well as over a continuous time frame. Furthermore, a comparison of the recorded music industry with the live music industry, and its impact on newcomers and innovation can also be an interesting exploration.

The possibilities are endless. The matter of critical importance at this point is that the music industry finds a way to bring about a balance of market powers while at the same time nurturing the development of new innovations and creators.

References

A2IM. (2014, January). *Indies still #1*. Retrieved from American Association of Independent Music: http://a2im.org/2014/01/15/indies-still-1-billboard-indie-label-market-share-increases-2-0-percent-to-34-6-percent-in-2013/

AIM. (2015). *Association of Independent Music*. Retrieved from Musicindie: http://www.musicindie.com/home

Alexander, P. (1994). New technology and market structure: Evidence from the music recording industry. *Journal of Cultural Economics*, 113-123. Retrieved from http://www.peterjalexander.com/images/New_Technology_and_Market_Structure.pdf

Amabile, T. (1988). A model of creativity and innovation in organizations. *Research in Organizational Behavior, X*, 123-167.

Anderson, C. (2006). *The Long Tail*. London: Random House.

Baregheh, A., Rowley, J., & Sambrook, S. (2009). Towards a multidisciplinary definition of innovation. *Management Decision, 47*, 1323-1339. Retrieved from http://dx.doi.org/10.1108/00251740910984578

Bhattacharjee, S., Gopal, R., Lertwachara, K., Marsden, J., & Telang, R. (2007). The Effect of Digital Sharing Technologies on Music Markets: A Survival Analysis of Albums on Ranking Charts. *Management Science, 53*, 1359-1374. doi:10.1287/mnsc.1070.0699

Billboard. (2007). *Ask Billboard*. Retrieved from Billboard: http://www.billboard.com/articles/news/1053854/ask-billboard

Billboard. (2007). *Chart Beat Chat*. Retrieved from Billboard: http://www.billboard.com/articles/news/1053818/chart-beat-chat

Billboard. (2008). *T.I. Sets New Record*. Retrieved from Billboard: http://www.billboard.com/articles/news/1044335/ti-sets-new-record-with-hot-100-no-1-jump

Billboard. (2015). *Billboard Charts Legend*. Retrieved from Billboard: https://www.billboard.com/biz/billboard-charts-legend

Billboard. (2015). *Indie Execs Voice Concern Over iTunes Store Changes*. Retrieved from Billboard: http://www.billboard.com/articles/6458259/apple-itunes-store-changes-concerns-indie-executive-major-label-executives

Bourreau, M., Gensollen, M., & Moreau, F. (2008). The Digitization of the Recorded Music Industry: Impact on Business Models and Scenarios of Evolution (Working Paper). *Telecom Paris*, 1-26.

Burke, A. (2011). The music Industry. In R. Towse, *A Handbook of Cultural Economics* (pp. 297-303).

Cameron, L., & Bazelon, C. (2013). *The impact of digitization on business models in copyright-driven industries: A review of the economic issues.* New York: National Research Council Committee.

Caves. (2000). *Creative Industries: Contracts between Art and Commerce.* Harvard University Press.

Clemons, E., & Lang, K. (2003). The Decoupling of Value Creation from Revenue: A Strategic Analysis of the Markets for Pure Information Goods. *Information Technology and Management, 4*, 259-287.

Giletti, T. (2012). *Why pay if it's free? (Master's thesis).* London: London School of Economics and Political Science.

Gosain, S., & Lee, Z. (2001). The Internet and the Reshaping of the Music CD Market. *Electronic Markets, 11*, 140-145. doi:10.1080/101967801300197061

Handke, C. (2006). Plain destruction or creative destruction? Copyright erosion and the evolution of the record industry. *Review of Economic Research on Copyright Issues*, 29-51. Retrieved from http://ssrn.com/abstract=1144318

Handke, C. (2012). Digital Copying and the Supply of Sound Recordings. *Information Economics and Policy, 24*, 15-29. doi:10.1016/j.infoecopol.2012.01.009

Handke, C. (2015). Digitization and Competition in Copyright Industries: One Step Forward and Two Steps Back? (Working Paper). 1-27.

Henderson, R. (1993). Underinvestment and incompetence as responses to radical innovation. *The RAND Journal of Economics, 24*, 248-270.

Hughes, J., & Lang, K. R. (2009). If I had a song: The culture of digital community networks and its impact on the music industry. *International Journal on Media Management, 5*, 180-189. doi:10.1080/14241270309390033

IFPI. (2001). *Recording Industry World Sales.* IFPI. Retrieved from http://www.ifpi.org/content/library/worldsales2000.pdf

Jones, M. L. (2012). *The Music Industries: From Conception to Consumption.* New York: Palgrave McMillan.

Kimberly, J. (1981). Managerial Innovation. In *Handbook of Organizational Design* (pp. 104-184). Oxford University Press.

Knopper, S. (2009). *Appetite for Self-Destruction: The Spectacular Crash of the Record Industry in the Digital Age.* New York: Simon and Schuster.

Krugman, P., Wells, R., & Graddy, K. (2008). *Economics.* New York: Worth Publishers.

Lam, C. K., & Tan, B. C. (2001). The internet is changing the music industry. *Communications of the ACM, 44,* pp 62-68. doi:10.1145/381641.381658

Liebowitz, S. (2006). File Sharing: Creative destruction or just plain destruction? *The Journal of Law and Economics*, 1-28.

Lorenzen, & Frederiksen. (2005). The Management of Projects and Product Experimentation: Examples from the Music Industry. *European Management Review*.

Menger, S. (2010). *The impact of digitalization on competition in the record industry (Master Thesis).* Rotterdam: Erasmus University Rotterdam.

Molanphy, C. (2013). *How The Hot 100 Became America's Hit Barometer*. Retrieved from NPR: http://www.npr.org/sections/therecord/2013/08/16/207879695/how-the-hot-100-became-americas-hit-barometer

Molteni, L., & Ordanini, A. (2003). consumption patterns, digital technology and music downloading. *Long Range Planning, 36,* 389-406. doi:10.1016/S0024-6301(03)00073-6

Mulligan, M. (2014). *The Death of the Long Tail.* Midia Research. Retrieved from http://www.promus.dk/files/MIDiA_Consulting_-_The_Death_of_the_Long_Tail.pdf

Oberholzer, F., & Strumpf, K. (2004). *The Effect of File Sharing on Record Sales - An Empirical Analysis (working paper).*

Office, U. C. (2015). *Copyright Law of the United States of America*. Retrieved from Copyright.gov: http://copyright.gov/title17/92preface.html

Pham, A. (2013, April). *iTunes Market Share Still Dominant After a Decade (Research).* Retrieved from Billboard: http://www.billboard.com/biz/articles/news/1557486/itunes-market-share-still-dominant-after-a-decade-research

RIAA. (2015). *News and Notes on 2014 RIAA Music Industry Shipment and Revenue Statistics.* RIAA. Retrieved from http://riaa.com/media/D1F4E3E8-D3E0-FCEE-BB55-FD8B35BC8785.pdf

Rosen, S. (1981). The Economics of Superstars. *The American Economic Review*, 845-858. Retrieved from http://users.polisci.wisc.edu/schatzberg/ps616/Rosen1981.pdf

Schumpeter, J. (1942). *Capitalism, Socialism and Democracy.* New York: Routledge. Retrieved from http://digamo.free.fr/capisoc.pdf

Shuker, R. (2002). *Popular Music: The Key Concepts.* London: Routledge.

Slater, D., Smith, M., Bambauer, D., Gasser, U., & Palfrey, J. (2005). Assessing the impact of policy choices on potential online business models in the music and film industries. *The Berkman Center for Internet and Society*, 1-83. Retrieved from http://cyber.law.harvard.edu/media/content_and_control

SunEagle, T. (2010). *Digital Models of Music: A Case Analysis of The Music Industry's Response to Technological Changes.*

Trust, G. (2013, September). *Ask Billboard: How Does The Hot 100 Work?* Retrieved from Billboard: http://www.billboard.com/articles/columns/ask-billboard/5740625/ask-billboard-how-does-the-hot-100-work

Tschmuck, P. (2003). *Creativity and innovation in the music industry* (Vol. 29). Innsbruck: Studienverlag.

Van de Ven, A. (1986). Central problems in the management of innovation. *Management Science, 32*, 590-607. Retrieved from http://www.jstor.org/stable/2631848

Wunsch-Vicent, S. (2014). The Economics of Copyright and the Internet. In *Handbook on the Economics of the Internet (Forthcoming)* (pp. 1-19). Edward Elgar.

Data Source:
Billboard.com
Discogs.com
RIAA.com (Shipment database - various issues)
Nielsen.com (Music report – various issues)
IFPI (Digital Music report – various issues)