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Streaming's Sonic Revolution — The Impact of Streaming Services on the Music Industry: Evidence from Spotify

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A Multivariable Analysis of the Influence of Digital Platforms on Music Stock Prices

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Abstract

In an era marked by the transition from physical to digital music consumption, this paper explores the disruptive influence of streaming platforms, focusing particularly on the emergence of Spotify as an industry pioneer and leader. Through a difference-in-differences regression model spanning from November 2015 to March 2020, this study investigates Spotify's impact on the stock prices of various companies within the music industry. Utilizing a subset of the Global Music Index (GMI), composed of 20 publicly traded companies across seven countries, the research analyzes how Spotify's milestones, including its launch in 2008 and April 2018 IPO, influenced the valuation of music labels, radio corporations, live event companies, and more. The findings reveal nuanced effects on different sectors of the music industry. Based on the regression analysis, it can be concluded that neither the IPO's announcement nor the official date had statistically significant impacts on the movement of music stock prices relative to the broader entertainment industry. By integrating quantitative analysis with qualitative insights from previous economic literature and industry perspectives, this research contributes to understanding the interaction between digital disruptors and traditional market dynamics.

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I Introduction

Once upon a time, in an enchanting era now draped in a haze of nostalgia, music was not an invisible file floating seamlessly through the air. Its tones were instead a tangible treasure, waiting to be discovered within the walls of brick-and-mortar emporiums known as record shops. In these sanctuaries, music-seekers embarked on journeys to discover their favorite melodies. Roaming through vinyl records, traversing through cassette players, and uncovering the secrets hidden within compact discs, each album served as a book of spells, physically connecting a potential fan to an artist's world. To possess music during this age was to own a piece of an artist's soul, a message of true dedication and lifelong passion. Serving as a palpable attachment, the process of perusing, choosing, and playing music was an immersive journey, a manifestation of personal taste, and a way to form bonds with others who shared similar sonic affections. This era, where music dwelled in the physical realm, sets the stage for a tale of the ever-evolving nature of sound consumption in the world's digital age.

The history of music technology is highly concentrated with breakthroughs that freed consumers from the constraints of the times. Radio provided convenience, the ability to listen to music on the go rather than having to attend a live performance. Vinyls provided optionality, the means of choosing the genre, artist, and album rather than conforming to limited and repetitive radio stations. Cassettes provided portability, the option to take and listen to a personal collection anywhere. Music's historical link with physical mediums has since been untangled. Today, the industry is set in a dynamic digital era. Just two decades ago, the masses raved over a device about the size of a deck of cards that stored a few thousand songs. Now, countless pieces of internet-connected hardware offer instant access to libraries of tens of millions of tracks.

But how did we get here?

Modern streaming services — Tidal, Apple Music, Spotify, *et al.* — represent a culmination of two decades worth of cutting-edge technological innovation. Their architects have unpacked and developed audio file formats, delivery platforms, and smart algorithms, while industry investors have converted that vision into today's subscription models. However, these now-popular names were not the industry's original pioneers — enter Napster in 1999. Also known as the pirates, Sean Parker and his shipmates provided the first peer-to-peer file-sharing system, offering access to millions of tracks, all for free. This breakthrough was observed by industry sharks and stakeholders as robbery rather than visionary, and so began the lawsuits. First came the Recording Industry Association of America (RIAA) in December 1999, suing Napster for copyright infringement. In April 2000, popular U.S. heavy metal band Metallica sued Napster for enabling the thievery of property. These lawsuits led to the termination of millions of Napster accounts, and the company ceased operations in 2001, ultimately filing for bankruptcy in June 2002 (History 2009). While Napster walked the plank in court, music labels and technology firms simultaneously attempted to present their own legal alternative to the platform. The most profound early effort was Apple's iTunes Store, launched in 2003 to complement that card-sized device, the iPod. However, New York City's famous namesake lacked today's advanced business model, only offering short previews of tracks with an invitation to purchase individually for $0.99. Regardless, Apple was not particularly fixated on being the first major streaming platform, instead concentrating on the software development that would boost iPod sales. Nonetheless, the foundation was laid. Consumers were still happy to pay for music, but instantaneity and ease were highly demanded. The iTunes store became the largest U.S. music vendor in 2008, surpassing Best Buy in April of that year.

There are key economic implications behind every story of an industry's digital disruption and modernization. Companies including Amazon, Uber, and Expedia are all prime historical examples of industry transformation through technology (retail, transportation services, and hospitality, respectively). In every case, a traditional pillar of an industry's structure is altered, ultimately benefiting the consumer. Amazon's vast selection of products, competitive prices, and convenient online shopping with fast delivery uprooted the traditional purchasing of everyday goods. Uber enabled rider convenience and choice through their request and payment mobile app. Expedia developed a comprehensive online travel platform, making it easier and more efficient to plan and book trips. While most cases of digital disruption seem to be beneficial from a consumer standpoint, especially when considering on-demand music via affordable subscriptions, there is variation in the impact on different groups of stakeholders. This is no different for the music industry. Previous literature surrounding the impact of streaming on music shows mixed results. Some economists argue positive effects, including increased artist-to-audience reach, music label profitability, and decreased instances of piracy and copyright (Carver 2016, Coffey 2016, Lipke 2019). Others claim that Spotify has negatively displaced artist royalties, led to the monopolization and dominance of top artists, and created challenges for non-spotlit sonic creators, such as songwriters, sound engineers, and producers (Aguiar and Waldfogel 2015, Sun 2019).

The disruptive impact of the music industry via streaming giants is the basis of what this paper examines. By employing an econometric regression model, this thesis investigates the relationship between Spotify's presence in the public market and the stock prices of various incumbent music industry players. This analysis encompasses record labels, radio providers, live event companies, and other relevant sectors that help in holistically representing the industry.

The dependent stock prices within the regression are analyzed using a subset of the makeup of the Global Music Index (GMI), a conglomerate that provides a snapshot of the stock performance of 20 companies traded on exchanges in seven countries: the United States, the Netherlands, South Korea, the United Kingdom, Germany, France, and China (Hong Kong). Relevant companies from the GMI have been selected based on the availability of price data for the chosen period of examination, November 2015 to March 2020. This period was selected based on two theoretical constraints: Spotify's February 2018 IPO announcement and the COVID-19 pandemic beginning in March 2020. Analyzing monthly stock price data that is equidistant in both directions from the IPO announcement leaves a 53-month time period, 26 months before and after the news eliciting investor reactions, with the midpoint month including the IPO announcement date. By examining the stock market performance of these companies, this research provides insight into the economic benefits and consequences of streaming services on subsets of the traditional music industry through changes in company valuation and investor sentiment.

Creating an economic framework to quantitatively demonstrate Spotify's industry impacts is critical as it addresses the transformative impact of digital disruptors on established industries. The emergence of Spotify as a dominant player in the music streaming landscape has challenged traditional business models, market structure, consumer behavior, and revenue streams while reshaping music access and interaction. By studying the link between Spotify's decision to go public and music stock prices, this paper contributes to the understanding of the impact of economic disruption, with a broader implication for understanding the dynamics of the digital economy and the challenges faced by industries in adapting to these forces. This paper contributes to the ongoing study of the interaction between digital disruption and traditional

market dynamics, focusing specifically on stock price regression analysis. Being the first to take on an IPO model of this sort within a music context, this research contributes to the existing body of knowledge surrounding IPO impact through a difference-in-differences frame.

The paper's structure proceeds as follows: Chapter 1 provides an in-depth historical review of the evolution of the music industry, with an eventual focus on the emergence of Spotify. This section sets a contextual backdrop for the quantitative analysis, establishing a foundation of knowledge regarding the industry's historical breakthroughs. This chapter also introduces Spotify's milestones, business model, and competitive landscape. Chapter 2 analyzes previous literature surrounding IPO impacts on competitors and outlines the research methodology employed in this study. The difference-in-differences regression models are presented, while the section dives into the data collection process, as well as the control and treatment group justifications. Chapter 3 presents the models' findings and conclusions. This section employs additional peer-edited cultural economics papers, interviews, and anecdotes from key industry stakeholders as supplementary avenues of research to the data trends from the model. Chapter 4 briefly concludes the findings, discusses their implications, and places them within the broader context of digital disruption in the music industry.

This paper finds that based on the difference-in-difference regression models ranging from November 2015 to March 2020, both Spotify's IPO announcement and official IPO date had no significant impact on music stock prices relative to the broader entertainment industry. The same results are found using the difference-in-differences model with the addition of fixed effects for each company and period. The study reveals that the lack of significant impact persists even when controlling for various market conditions and company-specific factors, suggesting robustness in the findings.

1 Hunting Flutes to Spotify: Evolution of Music Consumption

1.1 The Development of the Recording Industry

Many historians argue that ancient humans created the first flute-like instruments as part of hunting rituals and cultural gatherings. These instruments are estimated, in their earliest form, to date back about 40,000 years to the Paleolithic era (Maugh 2009). One of the oldest pieces of evidence attesting to human music-making was found in 2012 in what is now southwestern Germany. A flute made from the wing of a vulture, high-resolution carbon dated back 42,000 years. Sadly, most of the musical details from this time were lost in the darkness existing between prehistory and man's first civilized documentation efforts in Mesopotamia. However, since the birth of civilization between 3000 and 4000 BCE, the concept of live music progressed through the ancient lands. Through a long series of conquests, dynamic kingdoms, dynastic successions, and assimilation, civilization spread throughout the Mediterranean region.

Some notable examples of these civilizations include Ancient Egypt (3150 BCE), Greece (800 BCE), and Rome (500 BCE). The Greeks were especially innovative and responsible for the origination of many practices used in musical composition. Octaves, scales, and diatonic, concepts that the average listener can hear and subconsciously understand but not define, are attributed to this era of Greek music (Cartwright 2024). These ancient people also saw the evolution of some of the first modern instruments, such as the aulos, a reed instrument similar to the clarinet. Greek scholars, including Pythagoras (yes, the triangle theorem guy) developed the mathematical theories used to explain musical intervals and the movements of the heavens (he was quite versatile). The word music even comes from the Muses, the daughters of Zeus and patron goddesses of creative and intellectual endeavors.

Before sound could be captured mechanically, various mediums of inscriptions provided written instructions on how to reproduce music that was previously played. The earliest form of musical notation was found on a cuneiform tablet created in 2000 BCE in Babylonia, or modern-day Iraq (Kilmer 1986). Here, music began being recorded by hand, what we know today as sheet music. Picture this modern example: your daughter approaches the grand piano at her school recital. Clutched in her tiny hand is a weathered sheet of paper. As the audience leans in, she takes a breath and begins to play Beethoven's 5th Symphony. Often overlooked, what she is delivering is not just a performance but a piece of history. That crinkled paper represents a transcription by the master himself from centuries ago. Bridging the gap between Beethoven's era and today's audiences, attendees witness not just a talent show, but a testament to the enduring power of music passed down through four mere pages.[1]

Many scholars believe that modern live music tradition truly began with the European Middle Ages, marked by the fall of the Roman Empire in AD 476. Music was seen as a tool of sacred worship during most of the medieval ages, with the church at the forefront of live performance. Plainchant and Gregorian chants were used in Catholicism, and liturgical dramas were invented as a way of presenting music to the first theater audiences (Newman 2023). This progression paved the way for classical composers like Hildegard von Bingen, whose early works were written and performed in churches. As the Middle Ages came to a close around AD 1500, there arose a consumption demand outside of the venue, the desire to hear music without someone performing it. The Renaissance, Baroque, and Classical musical eras followed the Middle Ages' constraint to secularity and sparked other important developments. The printing press allowed for the mass production of music scores, the opera was invented, and the

[1] Debuted in 1808, Beethoven's original version was first commercially published by Breitkopf & Härtelin in April 1809. That version is actually 120 pages, but the Schaum Level 4 Piano Solo version is only four. Thankfully, Schaum adopted the masterpiece in a way that kept me awake at my sister's piano recitals.

symphony gained popularity. These eras, characterized by their early feats, laid the foundation for much of the modern Western music tradition. Even after these changes, though, consumption continued to be contingent on live performances, constrained to time and space. Some years later, a random American inventor stepped onto the scene with the creation of the first machine to record and playback sound: Thomas Edison and his phonograph.

Edison did not set out to create the phonograph as a way of consuming music. Rather, its invention in 1877 was an expansion of his previous work on the telegraph with Samuel Morse, and the telephone with Alexander Graham Bell and Antonio Meucci. Edison believed in a spoken message, a verbal version of the telegraph, but captured, recorded, and sent out to be listened to. When Edison published "The Phonograph and Its Future" in an 1878 issue of the North American Review, he noted that "The phonograph will undoubtedly be liberally devoted to music. A song sung on the phonograph is reproduced with marvelous accuracy and power" (Zantal-Wiener 2017). He was, in fact, correct. Within a few years, entrepreneurs began placing phonograph recordings into coin-slot machines on city streets, where passersby could listen to several minutes of audio. By 1881, pre-recorded cylinders, or records, were being sold, the first created by German-American inventor Emile Berliner. In the 1890s, phonograph parlors were established, where patrons could pay a nickel to listen to a recording. As the medium became more popular, manufacturing improved to multiple plays, until they were finally made in vinyl, introduced after World War II (Yale University Library 2011). But that was not before large corporations saw the potential profitability of the record business, with the first commercial record company being founded in 1889. The Columbia Phonograph Company (now Columbia Records) published its first catalog in 1890, featuring the United States Marine Band. Using blank records purchased from Edison, Columbia advertised the phonograph's utility quite simply,

to preserve the voices of family or “great artists” (Lugt 2017). Spillers, a record store in Cardiff, United Kingdom, claims to be the oldest record shop in the world. Founded in 1894 within an environment of phonograph parlors for the sale of phonographs, wax phonograph cylinders, and shellac phonograph discs. The store still exists today, but has since been relocated. The oldest U.S. record shop, Pennsylvania-based Bernie George’s Song Shop, was established in 1932 and continues to thrive today as well. As a predecessor to the record store and jukebox, the phonograph established itself as a significant milestone in the evolution of music consumption.

Another massive feat for the recording industry was developed in tandem with the timeline of the phonograph, the 1877 invention of the microphone, by Emile Berliner. While studying Alexander Graham Bell and Co.’s 1876 telephone, Berliner revolutionized the music production process by allowing for amplification, or music to be heard at louder volumes and over greater distances. However, Berliner was robbed of this feat that today not only impacts the music industry, but life as we know it. Without Berliner, your elementary school principal may not have been able to humiliate you over the loudspeaker for talking during assemblies. The story goes like this: Berliner filed a patent for the “carbon microphone” in 1877. Graham Bell, obviously recognizing the importance of Berliner’s work and its similarity to his plans, bought the patent for $50,000. However, Thomas Edison had also filed a patent for the product in that same year. The competing claims set off a legal battle between Berliner and Edison that spanned over 15 years. Finally, in 1892, the U.S. Supreme Court ruled that “The [carbon microphone] is, beyond controversy, the invention of Edison” (Boys 2024). Berliner, who had demonstrated his work a whole year before filing patents, was upset, believing Edison had stolen his ideas. Regardless of the last name attached to the microphone, its invention founded the commercial

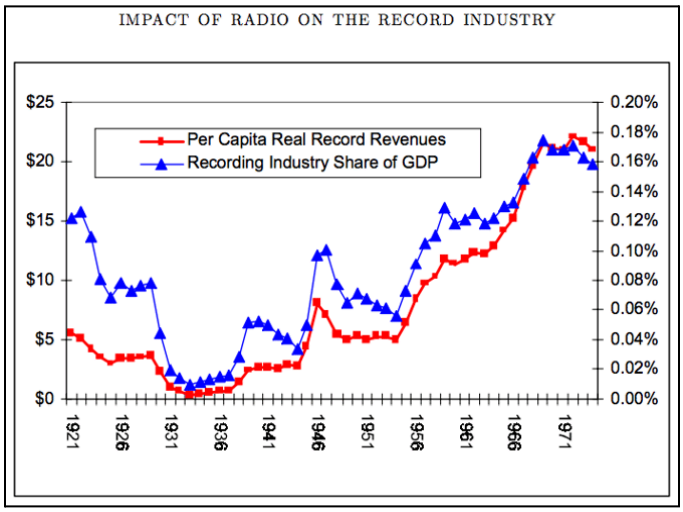
recording industry. The first commercial recording studio, the New York Phonograph Company, was founded amidst the legal drama in 1889.

Some speculate that, in its early days, musical recording came second to a song's sheet music. After all, before the advent of recording technology, classical sheet music was the primary method of commercial distribution and consumption. In Vinylmint's written history of the recording industry, they claim that "the music business was dominated not by major record labels, but by song publishers and big vaudeville and theater concerns…In those days, sheet music consistently outsold records of the same hit songs, proving that most of the music heard in homes and in public back then was played by people, not record players" (Medium 2014). However, as record technology improved and stores selling this technology grew in number, they became increasingly more popular. The source also claims that the practice of signing artists to labels began in 1904, when opera singer Enrico Caruso, whom many call the first-ever superstar artist, signed with Victor Talking Machine Company (now a subsidiary of Sony). The roots of Victor are quite fuzzy, but it is known that the company recorded the first music on vinyl in 1898, featuring a female vocalist singing the song "Twinkle, Twinkle, Little Star" (Acan 2022). From here, the term "record" became widely used. Victor recorded other great performers, such as Nellie Melba and Sergei Rachmaninoff. Other companies pounced on the opportunity to find, record, and profit off of emerging talent, generating more studios, more record labels, and more popular artists. But how did widespread audiences discover new genres and artists without having to experimentally purchase vinyl records? The solution was five words. Nikola Tesla and his radio (well, the commercial adoption of his radio).

On March 1, 1893, Nikola Tesla publicly demonstrated radio technology by transmitting electromagnetic energy without wires at the National Electric Light Association meeting in St.

Louis. About 30 years later, the first American commercial radio station, KDKA, went on the air as the first U.S. licensed broadcasting station with the presidential election results (Davis 2011). By 1925, five million American families owned broadcast radios. In the years before KDKA, record sales growth had doubled, making it the central medium for music consumption. However, by the time music made up a large proportion of what was broadcasted by radio stations, record sales saw a massive decline. Eventually, the two mediums found a way to work together, otherwise, the ability to listen to music on the radio would not be possible today. But, this history shows that the distribution of music can be tricky, with major implications for the listeners and the businesses behind them. The figure below shows the impact of radio on U.S. record sales. Seemingly at first having negative effects on the industry as a whole, it was eventually appreciated as the technology that provided additional exposure for label artists as the music creation profitability practice became more popular. Nowadays, radio stations purchase a license from record labels giving them access to large catalogs for listeners.

Figure 1 — The Impact of Radio on the Record Industry



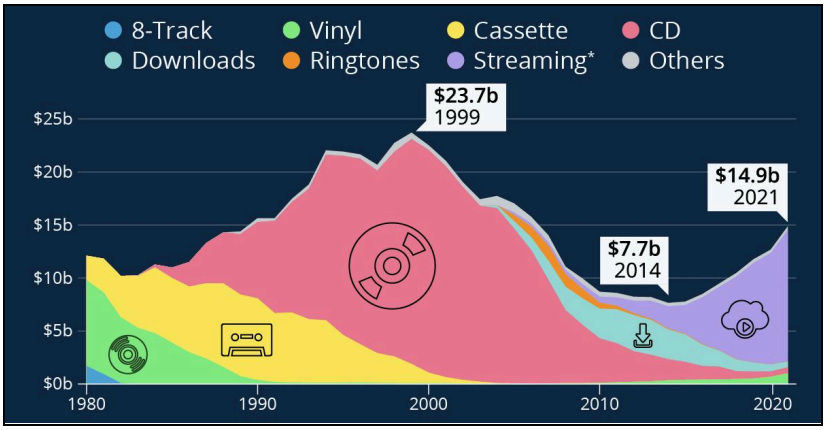
Source: Stan J. Liebowitz - Radio initially resulted in large disparities between Recording Industry Share of GDP and Real Record Revenues, but eventually found its place within the industry and drove industry success by the mid-1950s.

The next major music consumption advancement, the Cassette Tape, or Compact Cassette, was developed by the Philips company in 1962 in Belgium. By this time, music was completely different once again. We had the Billboard Charts, the Recording Industry Association of America, and, of course, The Beatles. This era is most prominently remembered by the complete domination of the charts by the Fab Four, along with Elvis Presley in the early portion of the decade and the Rolling Stones in the latter half. New genres including jazz, the blues, rock and roll, and many others emerged just before the Cassette came to life, bringing more and more music fans with each sonic addition. Philips released the invention at the Berlin Radio Show on August 30, 1963, to a European audience. Up until then, listening to music was largely vinyl-based or in-the-house-and-clunky radio-based, not particularly on-the-go friendly. The Cassette tape made it easy and convenient to take your favorite music with you. As one of the earliest formats of portable music listening, the real game-changer was the eight-track tape, invented in 1964 by Bill Lear. Soon, tapes were played portably for the first time in cars. In 1979, Sony debuted the first major portable Cassette player: The Walkman (Scholarly Community Encyclopedia 2018). Due to its highly personal nature, this portable player has been cited to not only change individual relationships with music but also with technology. Users were finally listening to their music of choice rather than through commercial radio stations or their vinyl collections.

At first glance, 20-30 years might seem like a long period. But in the context of technological developments, it is actually fairly short, and also roughly how long it took for Cassettes to cease being the dominant music consumption format. This was due to the introduction of the compact disc, otherwise known as the CD. A major turning point took place in 1981 when ABBA's "The Visitors" was the first pop album pressed to CD. By the following

decade, CDs were the new technological wave, with similar portable playing options, such as in-car players. In 1982, Sony released the first commercially available CD player, the Sony CDP-101. When Dire Straits released their new album "Brothers in Arms" in 1985, the CD version outsold the Cassette for the first time in music history (Bloomberg 2012). Soon after, CD sales jumped and the industry shifted its focus, making discs a permanent staple in the evolution of music-playing devices. Other versions of CDs, the CD-recordable (CD-R) and CD-rewritable (CD-RW) allowed individuals to purchase a blank disc and record their own sounds. With the recent invention of the internet, this ability spawned the creation of peer-to-peer music-sharing websites, which meant anyone could find a song on the internet and download it to their CD-R or CD-RW for a custom compilation. Initial versions of CD players were essentially radios with built-in disc readers, but when portable players hit the market, overall popularity for the product soared. The chart below shows the CD overtaking the Cassette tape in terms of music sector sales and business revenue. Look closely at the purple streaming wave, that is what we as consumers are fed today.

Figure 2 — From Tape to Tidal: 4 Decades of U.S. Music Sales



Source: RIAA - U.S. Recorded Music Revenues from 1980 - 2021, by format. This figure exemplifies the ever-evolving nature of methods of music consumption, including the Cassette, C.D., and eventually, streaming.

Around the era of CD rule, businesses began offering alternatives to buying music from a record store, or even having to leave the house to obtain it. One of the first developments in that direction was 1995's 1-800-Music-Now, an order-music-by-phone hotline. But the hotline did not last long, and two years later, ceased operations. That sequence of events was mentioned in the 1997 Economist article "Tremble, Everyone," which warned of the internet cannibalizing nearly every industry, music included, by introducing online buying options. Today, the piece is almost eerie to read, because a world without digital music is difficult to imagine. Four years later, the iPod was born, permanently changing the consumption of music once again.

Up until the CD player, early inventions all involved recording audio via a process titled analog. Analog audio records sound waves as continuous variations in physical properties, which are then translated into electrical signals. The process used nowadays, and at its earliest with the CD, is described as digital audio recording. Today's process differs from analog recording in two main ways, and the evolution is most simply defined by Bastien Ernst, a Producer for Bridge.audio in his 2023 description.[2]

"Digital audio is the result of a 2-step process of conversion from analog files.

1. *Sampling: In this step, the continuous analog audio signal is measured at regular intervals. These intervals are known as the "sampling rate." A higher sampling rate means more measurements per second, leading to a more accurate representation of the original analog signal. Common sampling rates are 44.1 kHz (used for CDs) and 48 kHz (used for digital video and audio production).*
2. *Quantization: After sampling, each measurement is assigned a numerical value. This process is called "quantization." The range of possible values depends on the "bit depth." A higher bit depth allows for a more precise numerical representation of the analog signal, leading to better sound quality. Common bit depths are 16 bits (used for CDs) and 24 bits (used for professional audio production)."*

[2] Basically, your parent's favorite artists used analog recording…but yours uses digital. Keep this in mind next time the "TV remote isn't working." The times were just different, digital is cheaper and easier to use. Analog came about with the Edison wave of recording inventions, while digital was pioneered by Japanese audio engineers. The first commercially available digitally recorded audio was "Something" by Steve Marcus & Jiro Inagaki in 1971.

The first digital audio file format was the WAV file, which is still widely used today due to its crystal-clear quality. However, WAV files are relatively large and take up lots of hard drive space, making them inconvenient for storing and music file-sharing. In 1991, however, the Fraunhofer Society in Germany developed a new digital audio file format called MP3. These files are much smaller than WAV files, while still providing good sound quality. This was made possible "by using a lossy compression algorithm, which discards some of the original sound data in order to reduce the file size" (Ernst 2023). MP3 files are 10-12 times smaller than WAV files for the same given duration, making them much easier to share, especially over the internet. Napster was the first to take full advantage of this technological breakthrough, introducing the original streaming service and allowing users to enjoy music on portable devices like laptops and smartphones. During Napster's copyright catastrophe, two Swedish entrepreneurs were on the prowl for a legal alternative. Spotify was born, and the industry changed forever, again.

1.2 Spotify: Early History & Success Story

The origins of Spotify can be traced back to 2006 when web designers Daniel Ek and Martin Lorentzon came up with the idea for a convenient digital music streaming service that would offer a wide catalog to listeners. By this time, the recording industry was an immovable portion of everyday life. While still largely physical, global recording industry revenues totaled around $20 billion. The initial idea behind the service was to create a platform that would allow users to stream music for free, with advertisements, or the option to pay for added features. The streaming giant's journey to the top of the market was never certain and remains tenuous in its ability to change with the industry, compete with other platforms, and evolve with consumer behaviors.

The idea for Spotify first came to Ek when Napster was shut down and Kazaa, a subsequent music-downloading service, became extinct. “I realized that you can never legislate away from piracy,” he told the Daily Telegraph in 2010. “Laws can definitely help, but it doesn’t take away the problem. The only way to solve the problem was to create a service that was better than piracy and at the same time compensate the music industry. That gave us Spotify.” Ek has previously sold an ad tech startup called Advertigo, becoming a millionaire at 23. Soon, he had a quarter-life crisis, buying a red Ferrari and indulging in nightlife. However, put simply, he hated it. “We made money when we were incredibly young, and in the beginning, we didn’t handle that well,” he went on to tell New York Times Magazine. “When you’re a computer geek, you think you want to be the guy with all the girls at the table…But I realized after a while that ain’t me.” From there, Ek followed his dream and founded Spotify with partner Martin Lorentzon, who acquired Advertigo. In July 2006, Ek began pitching the idea to European record labels in an attempt to obtain licensing rights to their music. “The music industry was in the shitter,” he said. The industry, at large, was falling victim to piracy, declining album sales, and a lack of innovation. “What did they have to lose? On top of that, I literally slept outside their offices, coming in week after week, hammering them down argument by argument.” It took two years to secure deals with the record companies in question, but finally, Spotify launched on October 7, 2008, in several European countries, including Sweden, France, Spain, Norway, and Finland.

Spotify was still not available in the United States, but there were clever ways of downloading from Europe. Meta CEO Mark Zuckerberg was one of those witty people, posting on his Facebook wall, “Spotify is so good,” after Sean Parker told him to check it out. The next day, Parker wrote Ek an email saying, “Ever since Napster, I’ve dreamt of building a product similar to Spotify.” The platform became more widely accepted, and rumors circled that Google

offered to buy the European streaming giant for almost $1 billion. However, Ek denies it, saying that Spotify has never been for sale and he's never had acquisition talks. By March 2011, Spotify surpassed 1 million paying customers, and in July of that year released in the United States, signing deals with the majority of major U.S. record labels, including Sony BMG, Hollywood Records, Warner Music, and Universal Music. 2012 marked another historic year for the company. The largest and most popular U.S. artists licensed their music to be played on the platform, Zuckerberg threw a Facebook and Spotify collaboration event, and President Obama published his first annual Spotify playlist. Metallica, the band who previously sued Napster and assisted in putting the startup out of business, agreed to have its catalog streamed on Spotify. Band leader Lars Ulrich appeared on stage with both Ek and Sean Parker to bury the hatchet publicly, while Ek revealed that Spotify had 5 million total paid subscribers, 20% of which came from the U.S. launch. Over the next few years, the platform made several moves to increase its mainstream appeal. A video advertisement series, the acquisition of Tunigo, which helped users find, create, and share new music and playlists on Spotify, and the expansion to 20 new markets, bringing the total up to 55.

Sounds profitable, right? Surprise, it was not. Spotify saw huge balance sheet losses after its 2008 launch. But Ek was never worried, as he told the Wall Street Journal, "I think a lot of people just look at the financials and say: Oh wow, losses, that's really, really bad. That's not at all how we see it, we see that we've actually now proved our business model. The difference between what we pay out in royalties and what we actually take in in revenue is increasing, which is positive." He also touched on some controversies that the platform saw with artists royalties, saying that he was "not surprised, but saddened. All they see is millions of streams, and they see, you know, not millions of dollars in the end, but thousands of dollars, and they think

that a million streams is comparable to a million downloads, which it obviously isn't" (Dredge, 2013).

In 2015, the company expanded to alternate mediums: podcasts, video streaming, and news radio, making deals with Vice, Comedy Central, ESPN, and the BBC. In the same year, both Apple Music and hip-hop icon Jay-Z's Tidal were released. The two competing platforms were seen as direct attacks on Spotify, using the same business model. Ek remained unphased, for he had larger plans at stake. In 2017, Spotify and Tencent Music, the largest digital service in China, invested in each other, establishing a strategic relationship. Ek's roadmap for Spotify was secured as the investment wiped out Spotify's losses, and then some. In February 2018, Spotify filed to go public. With their chosen listing method, direct listing or DLP, the business sells shares directly to the public without the help of any intermediaries. It does not involve any underwriters, there are no new shares issued, and there is no lockup period, or when early investors are not allowed to sell their shares, which typically lasts 90-180 days.

On April 3, 2018, Spotify completed its direct listing on the New York Stock Exchange under the ticker symbol SPOT. The company's pre-trading price was $132 per share, but the opening price per share was just under $166. On that day Spotify's shares closed at a price of $149 per share, up 12.9%. As of January 4, 2024, the year opening of the NYSE, Spotify's price per share was $311. The company, in its short life, had never presented a positive net income at the end of any year of operation. It closed 2020 with a net loss of $631 million while showing total revenue of $8.56 billion. Today, May 5th, 2024, the stock price sits at $296, a 100% increase all-time. The music industry, as a whole, had seen a sharp decline in revenues from 2001-2010, but Spotify seemed to be a white knight in terms of its resurgence. The industry reached an all-time high of $26.2 billion in revenue in 2022, up from its 2014 trough of $13.1 billion. In a

CNN interview, Ek said, “I don’t think we see ourselves as the savior of the music industry. We are passionate about making it so that users enjoy the music that they want to enjoy but at the same time fairly compensates artists. That’s not the same as saving the music industry…Again, this has been a big change. Not for us, but for the entire music industry. Music has moved from being about ownership to being about access, and I think that any major change and a disruption in an industry takes time. But we have great relationships with all of our label partners.” Savior or not, Spotify reshaped music consumption, offering access while addressing artist compensation in the digital age. Its journey serves as a testament to the enduring power of music. For a more intensive look at the technical analysis in regards to Spotify done by Wall Street analysts, see Spotify Technology S.A. Ordinary Shares (SPOT) Analyst Research | Nasdaq.

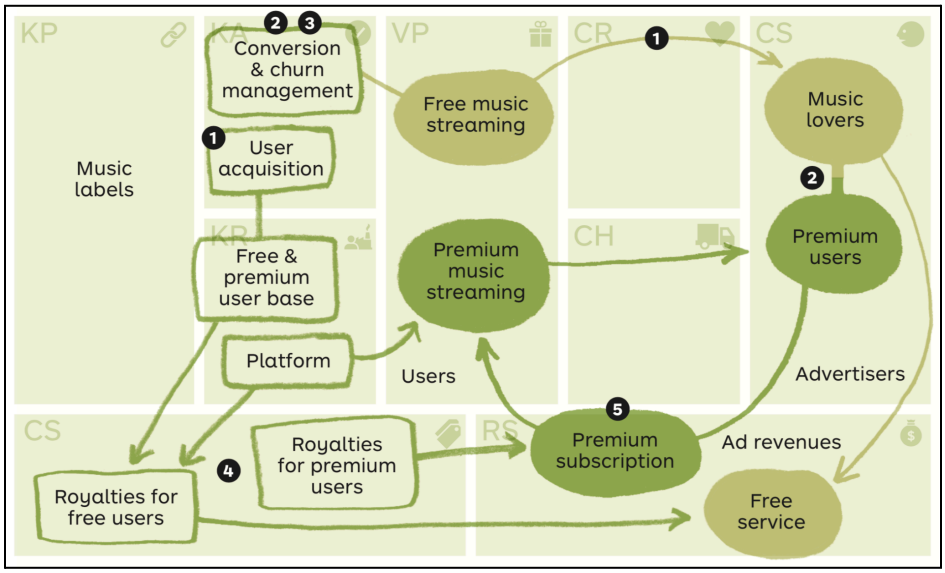
1.3 Spotify’s Business Model & Competitive Landscape

Spotify is the market leader in the digital music industry, with a 35% market share, and the largest streaming platform in the world since July 2016. In Q3 2023, the company had over 574 million users, 226 million of which were paid subscription customers, across 180 markets. The platform contains over 100 million tracks, 5 million podcasts, and 350,000 audiobooks.

Spotify relies heavily on its personalized algorithms and community of both users and artists to keep its premium experience meaningful and attractive. Its premium subscriber base has grown from 10% of total users in 2011 to 39% today (Strategyzer 2023). Before digital streaming, record labels’ traditional business model proved ineffective in responding to the spread of piracy. This model was based on record companies producing artists’ albums and distributing them through physical stores, direct mail clubs, and online e-tailers, as well as artists selling their CDs at concerts. It was suppressed by the “renegade business model” in which renegades – i.e. Napster – permitted listeners unauthorized P2P file sharing, allowing people to

get music for free and destroying record labels' revenue models (Andrews 2020). From the beginning, Spotify presented a legal alternative to pirated music and paid song purchases on iTunes. Their business model is outlined visually in the graphic on the next page.

Figure 3 — Spotify's Subscription-based Business Model



Source: Strategyzer - Spotify Business Model Canvas.

The customer conversion process follows these steps:

1. Draw in a substantial user community through a free service.

    Spotify's free version gives users access to a catalog of millions of songs. This avenue has basic functionality, while users have to listen to messages from advertisers that subsidize the free service.

2. Transition users who access the free service to a premium offering.

    Spotify has been extremely successful at converting free users to paid users. Its premium service has additional personalized features and removes advertising. In 2023, 40% of Spotify's users were 'premiumed', generating 90% of revenues.

3. Oversee customer retention and minimize attrition.

Similar to any subscription model, a user's lifetime value (LTV) signifies how much Spotify can earn from a user over time. LTV therefore increases the longer the company can retain users or manage customer churn. In the first six months of 2019, Spotify's premium subscriber churn rate fell to a record low of 4.6%.

4. Maintain an equilibrium between expenses.

Spotify pays record labels about 50% of streaming revenue. Over 85% of music streamed from Spotify belongs to four record labels: Sony, Universal, Warner, and Merlin. In 2018, Spotify paid $3.7 billion in royalties for premium users and $500 million for free users, equating to 74% of the company's expenses.

5. Sustain the operation through the income generated by premium subscriptions.

Spotify's user base grew to over 500 million users in 2023 for which it needs to pay royalties. Of those users, 54% consume music (limited catalogs) for free.

From its user, revenue, and paid customer growth, Spotify has effectively evolved the 'freemium' business model into an industry-dominating force. However, its success brought new players to the music streaming market. Broadly speaking, the music industry encompasses three main sub-industries: (1) the recorded music industry, corresponding to the process of production and distribution of the product; (2) the licensing music industry, corresponding to the recognition of composers' copyrights and royalties; and (3) the live music industry (Casagrande 2021). Spotify, operating in mainly the first sub-industry, sees direct competitors in Apple Music, Amazon Music, YouTube Music, Deezer, Tidal, Pandora, Google Play Music, SoundCloud, and iHeartRadio, while the company's indirect competitors include radio stations and CD sales. Per the IMS Business Report 2023, Spotify currently holds the top spot with a 35% market share, followed by Apple Music at 13.7%, Tencent Music at 13.4%, Amazon Music at 13.3%, and

YouTube Music at 8.9% (Stoll 2023). It is safe to say that although the music streaming industry is highly competitive, Spotify remains firmly at the top.

Before the digitalization of music, the recorded sub-industry had a much greater weight in terms of overall market revenue. New artists and young talent looked to sign contracts with record labels to produce and distribute their albums to wide audiences. In the old and traditional recorded music industry, artists needed to establish that relationship with a label, as it represented a unique way to be introduced to their international distribution systems. Digitalization deeply affected the music market's equilibrium, restructuring not only label revenues but also the balance in power between bargaining parties, artists, and labels.

The nature of consumer behavior changed with streaming as well. In the past, music lovers were required to purchase and listen to entire albums, on average 10-13 songs in length, to discover a maximum of 3-4 'hit' songs. Today, as soon as a new album enters the market, customers tend to stream more of a single hit than the entire album. This makes it easier to distinguish fans of a certain artist, who stream the entire album, from normal listeners who are mostly interested in widely-accepted popular music.[3]

The true definition of disruptive innovation takes on multiple forms. For example, Bower and Christensen (1995) define disruptive innovation as a process in which smaller firms with fewer resources challenge established incumbents by entering at the bottom of the market and moving upward. According to Walsh, Kirchhoff, and Newbert (2002), innovation is disruptive if it generates a service with different performance attributes than those mostly valued by existing customers. Per this exploration, Spotify fits the profile, but how did music investors react to the change in industry structure? Understanding these reactions sheds light on the adaptability and resilience of established market players in the face of disruptive forces.

[3] Top 40 Trudgers, I like to call them! You can also call them sheep.

2 Relevant Literature & Methodology

2.1 Literature Review

The following subsection examines relevant literature surrounding the historical impact of IPOs on various markets through an economic framework. In this portion, the importance of IPOs in financial markets and their implications for the performance of competitive incumbents is explored. By reviewing existing research, this chapter provides a comprehensive picture of the historical context and theoretical underpinnings of IPOs, laying the groundwork for the analysis of Spotify's effects on the dynamics of the music stock market.

Notable digital disruptors including Amazon, Uber, and Netflix have driven success by challenging pre-existing dominant firms and causing extreme shifts in industries, market dynamics, and consumer behavior (Sandberg et al. 2018). As a result, radical digital innovation has attracted substantial attention from researchers and practitioners since the 1990s with the explosion of information technology. Digital disruption, as an idea, is typically framed as environmental turbulence induced by digital innovation that erodes the common perception of traditional boundaries and approaches that previously served as foundations for the production and capture of value (Karimi and Walter 2015; Weill and Woerner 2015; Rauch et al. 2016). It is argued that digital disruption may, at some point, shake "the core of every industry" (Bonnet et al. 2015) and induce "short fuse, big bang" situations capable of threatening entire sectors (Farrall et al. 2012). Some note that obedience to and acceptance of digital disruption is crucial for the success of firms in the age of digitalization (Lucas Jr et al. 2013; Legner et al. 2017). Nevertheless, although professionals and academics concur on the overarching framework of digital disruption, its specific interpretation and connection to other prevalent notions within the

vast discourse on digital innovation remain ambiguous. For example, digital disruption is often conflated with disruptive innovation theory (Christensen 1997, 2006; Christensen et al. 2015), or the harnessing of technologies to drive innovation and create value. With this frame in mind, this review analyzes previous studies that took on the challenge of looking at the IPO's impact on competitive rivals.

Why would a company that is already experiencing paramount success decide to become traded on a public market? Researchers have proposed several hypotheses to explain why a private firm may go public. Matthew Spiegel and Heather Tookes discuss in their 2020 paper a reduced-form analysis that aggregates data across industries and IPOs to show a few empirical theories. Overall, they find that improving industry conditions, an increase in a firm's competitive strength, and a wide shift in consumer preferences are the positive results of a new IPO. These conclusions are especially relevant to Spotify's ultimate decision. Given the oligopolistic nature of music streaming, the market structure where a small number of large companies control most of the sales in an industry, Spotify took advantage of an opportunity to pursue all three of these presumed metrics of success. The other option, using private equity financing to opt out of public markets (as previously mentioned, Spotify needed financing to wipe debts and continue its scaling and expansion efforts), is discussed by Sreedhar Bharath and Amy Dittmar in their 2010 paper. The author's findings are twofold. They find support for the importance of many of the costs and benefits of being a public firm, specifically information and liquidity considerations. They also find support for the role of free cash flow, primarily in the pre-1990s period, and support for control and access to capital considerations. While Spotify had a "strong liquidity position," the decision ultimately came down to "acknowledg[ing] that [they]

needed an avenue to create liquidity for [their] early investors and employees who'd been with [them] for a long period of time." (Hyttinen 2024)

This paper's previous discussion of Napster outlines how the company pioneered file-sharing and peer-to-peer services, illegally revolutionizing music and paving the way for streaming services. However, Napster shut down its network on July 11, 2001, after a long court battle with the Recording Industry Association of America (RIAA). As a result, the company never entertained the idea of going public, the second wrinkle of this study. Although Napster came first, Spotify remains the prime candidate to demonstrate IPO impact within the music industry.

Previous literature points to both the economic benefits and drawbacks of companies that have gone through IPOs in different industries. Bach et al. (2013) analyze the impact of IPOs in growing industries on competing incumbent firms from a signaling standpoint. Through carefully selecting an industry to study, computer-related services, the authors found that due to the message an IPO announcement sends, this signal would reveal more accurate information about future opportunities for firms that are directly competing with the one announcing an IPO. Those firms that share similar attributes by being in direct competition would, therefore, best enjoy the positive information asymmetry regarding future market potential compared to indirectly competing firms. On the other hand, they found that if the IPO is not announced by a directly competing firm, then the impact on other firms is negligible. Demers and Lewellen (2003) further discuss the idea of IPOs not only being a signal to other firms of the potential for increased future demand but also a marketing force. Through examining the impact of IPO underpricing on website traffic, a direct measure of product market performance for internet firms, the study finds positive web traffic growth in the month after the IPO that is significantly

associated with initial returns, with the results being economically significant. Additionally, Reuer and Wu (2021) look at the impact of IPOs based on acquisitions of new ventures. They find that the announcements of IPOs in an industry can convey to potential acquirers information about the growth prospects of the rivals of ventures undertaking IPOs, thereby increasing their likelihood of being acquired. For example, when Google went public, initial returns could have driven up the valuation of IBM as stock prices are determined not only by supply and demand but also by the expectation of future earnings. IBM could then be acquired privately at a premium, using funds after paying back public investors to drive further projects.

More closely aligning with the goals of this study, Li et al. (2018) examine the impact of IPO approval on the price of existing stocks. Using an expectation-based downward-sloping demand curve hypothesis, the authors sift through the Chinese IPO approval regime and find converse effects relative to the studies previously cited. They conclude that IPO approval announcements negatively affect the price of related stocks, with the effect being more pronounced on stocks that are more correlated with the IPO. Their conclusions were found by documenting negative price reactions around the IPO listing day, largely relating to the trading of IPO shares. These findings turned out to be consistent with the results from a similar study conducted by Braun and Larrain in 2009. Through the examination of 254 IPO listings in 22 emerging markets, the paper found a negative impact of an IPO on the stock prices of its close substitutes, defined as stocks whose price movements are highly correlated with the return of the IPO firm's industry. Braun and Larrain find that selling a portfolio with the highest covariance with the IPO and buying the portfolio with the lowest covariance gives a spread of approximately 70 basis points during the month of the IPO, demonstrating the negative effect. In normal terms, you'd rather own stocks that are less correlated to the IPO firm as it will provide a

better short-term return because the highly correlated stocks tend to perform poorly. Similarly, Hsu et al. (2010) find that industry competitors experience negative stock returns when an IPO is filed, initially announced, and completed. Reinforcing the conclusion that IPOs are driving the results, they show that withdrawn IPOs have the opposite effect on industry incumbents, resulting in overall positive industry performance.

Several other studies present contrasting outcomes. Akhigbe et al. (2006) examine the impact of IPOs on rival firms and find that the valuation effects are insignificant. The authors find that the insignificant reaction can be explained by the presence of offsetting positive information and negative competitive effects. Significant positive information effects are associated with IPOs in regulated industries and the first IPO in the industry following a period of dormancy. Significant negative competitive effects are associated with relatively large IPOs in highly competitive industries, risky industries, better-performing industries, and those in the technology sector. This conclusion is reaffirmed by another paper from Spiegel and Tookes (2016), which finds that the industry losses as a result of a new IPO are strictly due to industry trends, while the IPO itself is simply a portent of those trends.

The following regression model keeps these general conclusions in mind when deriving proper theoretical methodology. While there is no question that Spotify had a major impact on the music industry, but how did it impact music stock investor sentiment? Considering these shifts in market structure, it is imperative to explore how this innovative wave influenced not just consumer preferences but also investor perceptions of the music industry's future trajectory. Understanding these dynamics can offer valuable insights into the evolving landscape of investment behavior within the music sector. This analysis aims to shed light on the nuanced interplay between technological disruptions and financial market sentiments.

2.2 Treatment and Control Group Selection

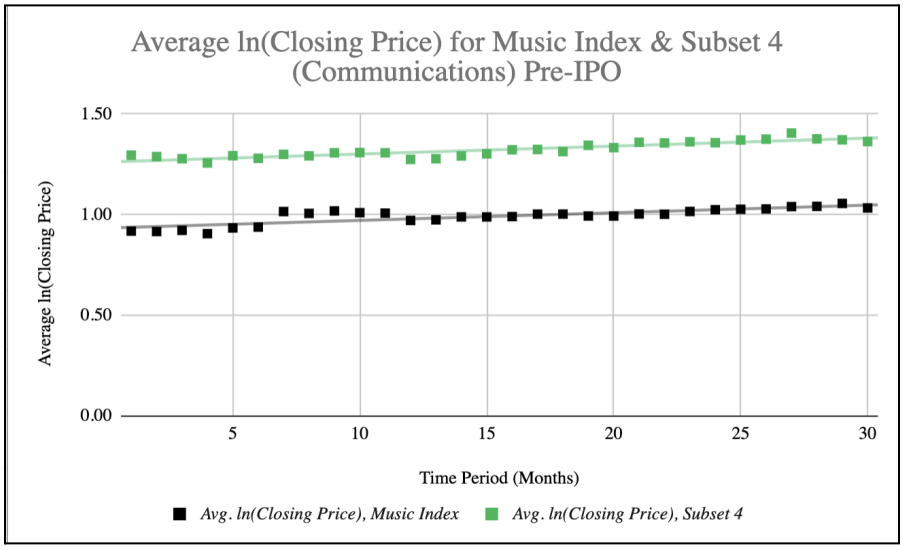
The subsequent sections of this chapter delve into the intricacies of the difference-in-differences regression model, its methodology, and the structural framework employed to assess Spotify's influence on the stock market. Through an analytical approach, the model aims to unveil the interaction between Spotify's market presence and the fluctuations observed within the music industry's stock prices. Through a meticulous examination of variables, control groups, and statistical techniques, the model provides a comprehensive understanding of how Spotify's activities may correlate with the broader financial landscape of the music sector. This methodology allows for the evaluation of Spotify's specific impact, distinguishing it from other concurrent market forces.

The data collection for this paper relied heavily on the companies chosen for the treatment and control groups for the difference-in-differences regression model. The treatment group contains music corporations expected to be directly impacted by the introduction of Spotify into the public market, while the control group contains a subset of those involved in the broader entertainment business, expected to move in tandem with music stocks given typical market conditions.

A critical step within this study was the identification of the treatment and control group companies. To accomplish an accurate selection based on theoretical justifications, subsets of companies within the entertainment sector were examined to determine their correlation with a hypothetical global music index. This index differs slightly from the official GMI discussed in the paper's opening, as a subset of the companies within the index were taken with a few additions. The reasoning for each addition can be found below in the individual company profiles. The hypothetical index served as a benchmark for the overall stock movement of the

music industry. To construct the index, relevant treatment companies were identified, and the average of the natural logarithm of each monthly closing price over the period was calculated. This process enabled the observation of how these treatment companies collectively moved together over time. Subsequently, control group subsets within the entertainment industry were selected for empirical comparison against the treatment group. The control companies were chosen based on their lack of direct association with Spotify's IPO. The subsets tested included media, film, gaming, and communications. By examining the movement of these control groups in relation to the treatment group before the IPO, the selection of appropriate control companies was justified, visually represented in the chart below.[4] This selection methodology ensured that the control groups accurately represented the trend of the entertainment sector, distinct from the specific impact of Spotify's IPO on music stocks. This systematic approach provides a robust analysis of the IPO's effects on the music industry within the broader context of entertainment market dynamics. The companies chosen for each group are listed in the paper's next section.

Figure 4 — Control Group Selection Model, Pre-IPO Period



[4] The *Avg. ln(Closing Price) Music Index*, portrayed in black, was designed for control group validation during regression analysis; within the subsequent models, each stock's *ln(Closing Price)* served as individual data points.

2.2.01 Control Group - Company Profiles (Communications Subset)

1. *LY Corporation (4689.T).* LY is a Japanese internet holding company, with an ownership stake in Line Corporation, Yahoo! Japan, Zee Entertainment, and Zee Data.
2. *News Corporation (NWSA).* News Corp. is a media company that provides entertainment and information through multimedia content.
3. *Verizon Communications Inc. (VZ).* Verizon is a leading provider of technology and communications services.
4. *Electronic Arts Inc. (EA).* Electronic Arts is a global leader in digital interactive entertainment. EA develops, markets, publishes, and distributes video games for consoles, mobile devices, and personal computers.

2.2.02 Treatment Group - Company Profiles

1. *Sony Group Corporation (SONY).* Sony Group owns Sony Music Entertainment (SME), a global recording company with a roster featuring superstars from label groups that include Columbia, RCA, Epic, Sony Music Nashville, and Sony Classical.
2. *Live Nation Entertainment (LYV).* Live Nation promotes, operates, and manages ticket sales for global live entertainment. The company also manages the careers of artists and has controlling interests in 338 venues globally, known as the largest live entertainment company in the world.
3. *SM Entertainment Co., Ltd. (041510. KQ).* SM Entertainment is a Korean record label, talent agency, and music publishing company. Managing some of the largest K-pop artists in the world, SM oversees the entire music output process.

4. *Avex Group Holdings Inc. (7860.T).* Avex is a Japan-based music production, talent management, and event coordination company. An acronym of the English words Audio Visual EXpert, the company has opened a music school, recording studios, and an artist brand management branch since its founding in 1988.
5. *Stingray Group Inc. (RAY-A.TO).* Stingray Group is a Canada-based media company that provides music services to consumers and businesses. Stingray's product portfolio includes 16 brands that range from multi-platform music services to radio stations, music applications, digital experiences, and in-store music.
6. *Sirius XM Holdings Inc. (SIRI).* SiriusXM is a satellite radio company that offers a wide variety of audio programming to subscribers in North America. Customers, through a subscription, can enjoy ad-free music, sports, news, and more.
7. *Pandora (PNDORA.CO).* Pandora is a music streaming radio service and a direct competitor to Spotify. Pandora provides consumers with a personalized music listening experience with its proprietary Music Genome Project® technology.
8. *YG Entertainment (122870. KQ).* YG Entertainment is a South Korean entertainment agency with a record label, talent agency, and music production capabilities. The company uses a specialized process to cast new talent and develop artists.
9. *Vivendi SE (VIV.PA).* Vivendi owns and operates a portfolio of businesses in recorded music, music publishing, merchandising, and audio-visual content. Vivendi identifies and develops recording artists and songwriters and produces, distributes, and promotes commercially successful music. The company is also the largest stakeholder of U.S. record label Universal Music Group (UMG).

10. *Urban One, Inc. (UONEK)*. Urban One's core business is its radio broadcasting franchise, the largest radio operation that primarily targets African-American and urban listeners. The company currently operates 55 broadcast stations across 16 North American markets.

11. *NetEase, Inc. (NTES)*. NetEase is a Chinese internet giant that owns NetEase Cloud Music, a music streaming service that competes with Spotify. NetEase Cloud Music is China's second-largest music streaming provider. It has over 800 million registered users and 41.8 million paying subscribers. Since Spotify is not available in China, it will be interesting to evaluate investor sentiment conditional on geo-political restrictions.

12. *Paramount Global (PARA)*. Paramount has several initiatives related to the music industry: Paramount Music, a record label, and their annual Paramount Music Showcase, an initiative that provides mentorship and opportunities for underrepresented individuals in music. The company owns many recording studios, where some of the largest artists in the world have worked on projects, including Louis Armstrong, Tupac, and Coldplay.

13. *T4F Entretenimento S.A. (SHOW3.SA)*. T4F Entretenimento is a Brazil-based company that engages in the live entertainment sector. The company is active in the administration, promotion, organization, production, and implementation of live entertainment activities.

14. *Jaxsta Limited (JXT.AX)*. Jaxsta is a music database that provides official music credits to artists, producers, engineers, songwriters, and more. Founded in 2015, Jaxsta ensures those who create music receive credit where credit is due.

15. *Dolby Laboratories, Inc. (DLB)*. Dolby is a company that creates audio, visual, and voice technologies for music, TV, movies, and gaming. The company is partnered with Ableton Live, Logic, Pro Tools, FL Studio, and other popular digital audio workstations, the computer software applications used to record, edit, and produce music.

2.3 Classic Difference-in-Differences Methodology

A difference-in-differences regression (DID) is used to assess the causal effect of an event by comparing the set of units where the event happened (treatment group) in relation to units where the event did not happen (control group).[5] To set up the regression model, the following regression equation is presented:

Equation 1

$$ln(ClosingPrice)_{it} = \alpha + \beta Treatment_i + \gamma PostIPO_t + \delta(Treatment_i \cdot PostIPO_t) + \eta_{it}$$

The dependent variable is the natural logarithm of the closing stock price in USD, $ln(ClosingPrice)$. The natural logarithm of each closing price was taken to stabilize variance and increase interpretability, while also being a common practice within financial market studies. The explanatory variables include three indicator or dummy variables, $Treatment$, $PostIPO$, and $(Treatment \cdot PostIPO)$. The variable $Treatment$ allows the examination of a company's relative response to Spotify's IPO. $Treatment = 1$ if the company lies in the treatment group, and $Treatment = 0$ if it finds itself in the control group. $PostIPO$ is a dummy variable indicating pre- and post-treatment. $PostIPO = 0$ if the monthly stock closing value was obtained before the IPO and $PostIPO = 1$ if afterward. $(Treat \cdot PostIPO)$ is a dummy variable indicating whether the outcome was observed in the treatment group and it was observed after the IPO, $(Treatment \cdot PostIPO) = 1$, or any other case, $(Treatment \cdot PostIPO) = 0$. The treatment effect is observed through the coefficient on the $(Treatment \cdot PostIPO)$ variable, δ. Additionally, η_{it} represents the error term in all equations.

[5] The difference-in-difference (DID) technique originated in the field of econometrics, but the logic underlying the technique has been used as early as the 1850's by social scientists like John Snow. They call it the 'controlled before-and-after study' in some social sciences (Columbia University Mailman School of Public Health).

Running just one regression using Spotify's listing date may not exactly capture the whole picture. For this reason, an additional regression was run using the IPO announcement date as the time threshold, alongside Spotify's official listing date, offering a more comprehensive look at the impact on stock prices. This approach allows for the examination of market reactions both before and after the public announcement of the IPO. Understanding post-announcement movements is crucial, as stock prices often adjust as information becomes public knowledge. By isolating the effects of the announcement itself from those of the actual IPO, this regression helps differentiate between anticipatory market adjustments and those directly tied to the IPO date. For these reasons, a second regression is presented using the variables $PostAnnouncement$, replacing $PostIPO$, and $(Treatment \cdot PostAnnouncement)$ in place of $(Treatment \cdot PostIPO)$. The second regression equation is as follows:

Equation 2

$$ln(ClosingPrice)_{it} = \alpha + \beta Treatment_i + \gamma PostAnn_t + \delta(Treatment_i \cdot PostAnn_t) + \eta_{it}$$

Again, the treatment effect is measured through the coefficient δ, further explained below. $PostAnn$ replaces $PostIPO$, where $PostAnn = 1$ if the data point was taken after the announcement of the IPO and $PostAnn = 0$ if before. The same regression format was run to analyze the effect of new information on the companies in question, not just the period where Spotify's direct listing came about. This expanded analysis helps to capture the broader impact of market reactions to the information surrounding the IPO, providing more understanding of the dynamics at play. These models were run alongside additional two-way fixed effect models to control for additional variables and compare the results of the classic models to the two-way fixed effect models. All models were run using the statistical analysis capabilities of STATA.

2.4 Two-Way Fixed Effect Difference-in-Differences Methodology

In order to control for several additional variables, the classic difference-in-differences models were updated into two additional equations. The equations were reshaped by incorporating fixed effects for each company and period (month). The updated equation now includes $CompanyFixedEffect_i$, capturing the unobserved characteristics specific to each company that may influence stock prices. Additionally, $PeriodFixedEffect_t$ is introduced, representing unobserved factors affecting all companies during specific periods. By integrating these fixed effects, the model adjusts for potential biases arising from these unobserved variables, enabling a more precise estimation of Spotify's IPO impact on music stock prices. The updated regression models are as follows:

Equation 3

$$ln(ClosingPrice)_{it} = \chi CompanyFE_i + \varepsilon PeriodFE_t + \delta(Treatment_i \cdot PostIPO_t) + \eta_{it}$$

Equation 4

$$ln(ClosingPrice)_{it} = \chi CompanyFE_i + \varepsilon PeriodFE_t + \delta(Treatment_i \cdot PostAnn_t) + \eta_{it}$$

These models replace the $Treatment$ and $Post$ variables with fixed effects for each company and month, denoted as $CompanyFE$ and $PeriodFE$. While the treatment effect remains δ, the new coefficients were chosen based on the international honor society in the field of economics, Omicron Delta Epsilon. However, delta already represents the treatment effect, so I chose the second two letters of Omicron Chi Epsilon, which merged with Omicron Delta Gamma to form Omicron Delta Epsilon in 1963.[6]

[6] The second two letters may seem like a strange choice, but Omicron, o, looks too much like a zero. Considering this paper is for academic credit, I didn't need any critical feedback regarding my preference of Greek letters.

2.5 Hypothesis Test

For the hypothesis test investigating the impact of Spotify's IPO on the music stock market, a two-tailed test is employed to assess any directional changes in stock prices. This test considers the possibility of both positive and negative impacts stemming from the IPO. The null hypothesis, $H_0: \delta = 0$, where δ represents the population population parameter, states that the Spotify IPO had no significant impact on the music stock market, while the alternative hypothesis, $H_a: \delta \neq 0$, posits that there was indeed a significant impact, regardless of direction. By conducting a two-tailed test, the analysis explores whether the stock prices of music-related companies exhibited statistically significant differences before and after the IPO. This approach enables the ability to capture any substantial shifts in stock prices, whether they increased or decreased following Spotify's public offering. There are three possible cases when the regressions are run. The first, $\delta > 0$, signifies a positive impact of the announcement and IPO on the music stocks relative to the control group. The second, $\delta < 0$, means that the music companies' valuations were impacted negatively relative to the broader entertainment industry as a result of the announcement or IPO. Thirdly, $\delta = 0$, is the case in which the null hypothesis would fail to be rejected, meaning that the announcement or IPO had no statistically significant impact on the music stock market relative to the broader entertainment industry. A zero effect would most likely point to the canceling out of positive and negative effects on the industry. When the impact of its emergence is analyzed based on the perspective of a live event company, we may hypothesize that Spotify increased artist-to-audience reach and therefore led to more fans, more festival attendance, and therefore higher profits for a corporation like Live Nation. On the other hand, a negative effect may take place among radio companies because of the change in consumer behavior, of which there are a few in the treatment group, like Pandora and SiriusXM.

2.6 Treatment Effect Calculation

To calculate the treatment effect for the Spotify Announcement and IPO, the expected values of each scenario are calculated using the natural logarithm of the stock prices of companies that fall into each category of data, (control, treatment, pre-threshold, post-threshold). The before-after difference in the outcome, denoted as Y below, for the treatment group, the before-after difference in the outcome for the control group, and the difference between the difference in outcomes for the treatment group and the difference for the control group is then calculated.[7] The four cases are as follows:

$E(Y|\ D = 1,\ Post = 1)$, ln(closing price) of treatment companies after the time threshold.

$E(Y|\ D = 1,\ Post = 0)$, ln(closing price) of treatment companies before the time threshold.

$E(Y|\ D = 0,\ Post = 1)$, ln(closing price) of control companies after the time threshold.

$E(Y|\ D = 0,\ Post = 0)$, ln(closing price) of control companies before the time threshold.

The expected values are calculated based on the average of each case, and the following method is used to solve for the treatment effect:

$$k_{DD} = (E(Y|\ D = 1,\ Post = 1) - E(Y|\ D = 1,\ Post = 0)) - (E(Y|\ D = 0,\ Post = 1) - E(Y|\ D = 0,\ Post = 0))$$

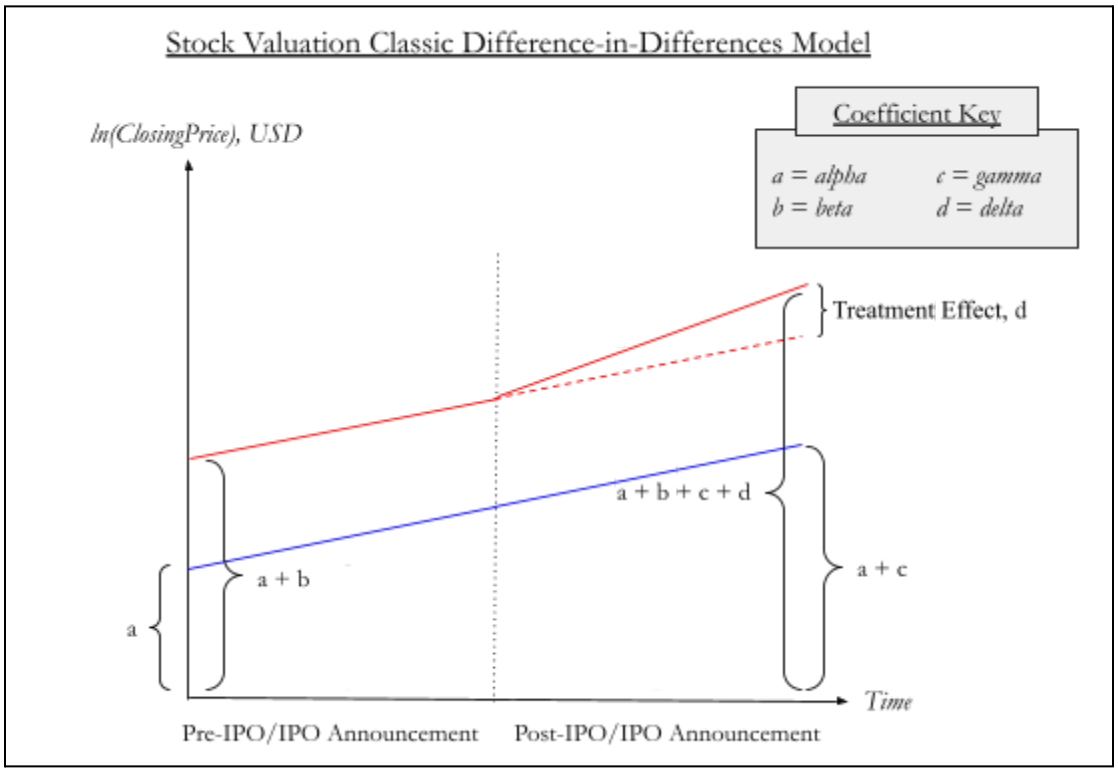
The treatment effect, δ, is also denoted as k_{DD}, with the following equation showing what regression equations 1 and 2 are precisely measuring.

$$k_{DD} = (Y_{Treatment,\ Post} - Y_{Treatment,\ Pre}) - (Y_{Control,\ Post} - Y_{Control,\ Pre})$$

[7] Doing this by hand sounds grueling, and it definitely is. especially when my excel file is 1009 rows in length. This is simply a description of what is going on behind the scenes, with STATA doing all of the economic arithmetic.

This calculation allows for the elimination of potential selection bias between the treatment and control groups. This method enables the quantification of the change in stock price for the treatment companies post-Spotify IPO/ Announcement. The figure below represents the significance of each coefficient within the classic difference-in-differences equation.

Figure 5 — Classic Difference-in-Differences (Equations 1 & 2) Coefficient Visual



2.7 Data Collection & Organization

For the carefully chosen 53-month period, November 2015 to March 2020, data was collected on the monthly closing price of each company's stock. All treatment companies' prices were tested in the following models, comparing them to the individual control companies' prices in the regressions. Again, the indices created in section 2.2 simply allowed for the visual justification of stock movement across the music market and the communications market, sitting under the umbrella of entertainment. The stock prices of international companies have been

converted to USD using currency exchange rates as of December 6th, 2023.[8] Historical data was pulled from Yahoo Finance's period and granularity functions. The data is organized in a tabular format, with each row representing a specific data point for each company. The columns include "Company Name," indicating the name of the company; "Date," which records the specific date of the data point; "ln(Closing Price)," representing the natural logarithm of the closing price of the company's stock on the respective date; "Treatment/Control Group," where '1' denotes the data point belonging to a treatment group and '0' to a control group; and "Pre/Post IPO Date" and "Pre/Post Announcement," with '1' indicating data points recorded after the IPO date/ IPO Announcement date and '0' before.

2.8 Compiled Regression Equations

Equation 1

$$ln(ClosingPrice)_{it} = \alpha + \beta Treatment_i + \gamma PostIPO_t + \delta(Treatment_i \cdot PostIPO_t) + \eta_{it}$$

Equation 2

$$ln(ClosingPrice)_{it} = \alpha + \beta Treatment_i + \gamma PostAnn_t + \delta(Treatment_i \cdot PostAnn_t) + \eta_{it}$$

Equation 3

$$ln(ClosingPrice)_{it} = \chi CompanyFE_i + \varepsilon PeriodFE_t + \delta(Treatment_i \cdot PostIPO_t) + \eta_{it}$$

Equation 4

$$ln(ClosingPrice)_{it} = \chi CompanyFE_i + \varepsilon PeriodFE_t + \delta(Treatment_i \cdot PostAnn_t) + \eta_{it}$$

[8] Although most stocks in the treatment group are traded in USD, the group aims to reflect global music investor sentiment. To achieve this, companies from various countries are included. However, fluctuations in exchange rates for currencies such as AUD, CAD, CNY, JPY, KRW, and EUR were minimal during the study period, ensuring no significant statistical discrepancies in the results.

3 Streaming's Quantitative Impact on the Stock Market

3.1 Regression Results & Coefficient Interpretation

The following table presents the results of the regression analysis examining the effects of Spotify's announcement and IPO on music stock prices, utilizing both the classic difference-in-differences model (DID) and the difference-in-differences model with fixed effects for each company and month (DID FE_2). The dependent variable in these models is the natural logarithm of the closing price of music stocks. The table below displays the coefficients and standard errors for various variables, including the treatment effect, the post-period, and their interactions. The standard errors are provided in parentheses, with significance levels denoted by *** for $p < 0.01$, ** for $p < 0.05$, and * for $p < 0.1$.

Table 1 — Effects of Announcement & IPO on Music Stock Prices: DID, DID FE_2 Models

	Dependent Variable = Ln(ClosingPrice), individual prices			
	(I)	(II)	(III)	(IV)
VARIABLES	DID	DID FE_2	DID	DID FE_2
Post_IPO	-0.0135			
	(0.101)			
Treatment	-0.235***		-0.235***	
	(0.0749)		(0.0775)	
Treatment*Post_IPO	**0.0250**	**0.0250**		
	(0.114)	(0.0174)		
Post_Announcement			-0.00566	
			(0.100)	
Treatment*Post_Announcement			**0.0231**	**0.0231**
			(0.113)	(0.0173)
Constant	1.323***		1.320***	
	(0.0665)		(0.0689)	
Observations	1,007	1,007	1,007	1,007
R-squared	0.016	0.978	0.016	0.978
Company Fixed Effect (Y/N)	N	Y	N	Y
Period Fixed Effect (Y/N)	N	Y	N	Y
Standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$				
DID: Classic Difference-in-Differences, DID FE_2: Difference-in-Differences w/ Fixed Effects				

3.2 Classic Difference-in-Differences (DID) Results & Interpretation

The first regression, denoted by Column I in the table, shows the impact of Spotify's official IPO date on music stock prices without company and period fixed effects. The treatment effect, or the coefficient of the ($Treatment \cdot PostIPO$) variable is 0.0250 with a standard error of 0.114. The positive treatment effect suggests that there is a numerical increase in the average closing price of music stocks for companies theoretically affected by Spotify's IPO compared to the control group, of roughly 2.5%. However, this increase is not considered significant from a statistical standpoint as the resulting p-value of 0.826 is above the conventional threshold of significance. This suggests that the observed positive effect could have occurred due to random chance or other variables rather than the IPO. We therefore fail to reject the null hypothesis as the results are insignificant.

The table's third regression, denoted by Column III, shows the impact of Spotify's IPO announcement on the music stock market, again without fixed effects. Here, the results are similar. The treatment effect, or the coefficient on the ($Treatment \cdot PostAnnouncement$) variable, is also positive, at 0.0231 with a standard error of 0.113. This coefficient suggests similar findings to the first regression, that there is a numerical increase in the average closing price of music stocks for companies theoretically affected by Spotify's announcement compared to the control group, of about 2.3%. Similarly, though, the stock price increase is not considered significant as the p-value of 0.838 is above the threshold of significance. This means that similarly to the official IPO date, we fail to reject the null hypothesis as the results are insignificant. The r-squared values for each regression are also quite low, at 0.016, meaning that the independent variables do not explain much of the dependent variable's variation. This is amended with the fixed effect regression, and their results are shown below.

3.3 Difference-in-Differences with Fixed Effects (DID FE_2) Results & Interpretation

The fixed effect models effectively controlled for the lack of explanation of the variation in the dependent variables by the independent variables seen in the classic models. As a result, r-squared soared to a higher level of 0.978.

The first fixed effects model, shown in Column II, outlines the impact of the official IPO date on stocks using both company and period fixed effects. Interestingly, the same treatment effect was found in Column I, the model without fixed effects, 0.025. This alludes to the same 2.5% increase in the treatment group relative to the control group after Spotify's IPO. However, similar to the classic model, the results were insignificant at all levels. This means that even when controlling for unobserved differences in company and period, the treatment group's increase in price relative to the control group was not driven by Spotify's official IPO date.

The second fixed effects model, denoted by Column IV, shows the impact of the IPO announcement on the stocks in question using the same fixed effects. Again, the same treatment effect as the classic model was derived, at 0.0231, alluding to the same increase in the treatment group price relative to control group price. However, once again, the results were statistically insignificant at all levels.

Failing to reject the null hypothesis in all cases, it can be concluded that neither the IPO announcement nor the official date had significant impacts on the movement of music stock prices relative to the broader entertainment industry, even when company and monthly market variations are controlled for. This 'zero effect' underscores the complexity of stock price dynamics and highlights the need for a more nuanced understanding of various factors that impact stock performance beyond isolated events such as IPOs and announcements.

3.4 A Look at Spotify's True Impact - Anecdotes from Popular Artists

After conducting regression analysis to investigate the influence of Spotify's initial public offering on music stocks, the results revealed a notable absence of any significant effect. This finding, while shedding light on the market dynamics surrounding such events, prompts a deeper exploration into the implications of streaming platforms within the music industry. To complement these statistical insights, it is crucial to delve into the perspectives of industry stakeholders, from artists and producers to label owners and executives, regarding the profound impact of streaming services on their craft, livelihoods, and the overall landscape of music consumption. Their varied experiences and observations offer insight into the evolving relationship between technology, finance, and artistic endeavors in the digital age.

Undoubtedly, the convenience of streaming has vastly expanded artists' reach to their fanbases. Gone are the days of trekking to a store for the latest vinyl or CD. Now, with just a few clicks on your device, listening to your favorite artist's new album on a Friday morning has become effortless.[9] How, then, do artists truly feel about the streaming revolution? Would Michael Jackson have sold over one million copies of Thriller in the first week if he put the project out in 2020? The answer is, no one really knows. But for a bit of context, one physical album sale is equivalent to 1,500 on-demand audio and/or video song streams in the United States. In Michael's case, he would need about 1.5 billion streams to sell exactly what he did back in 1982. Is this possible today? Technically, yes, and artists like Adele and Taylor Swift have showcased the potential equivalent by selling millions of copies in their first week. But even top-selling artists' relationships with streaming platforms have been historically rocky.

[9] Artists tend to drop projects on Fridays to maximize 'first-week sales,' a concept that influences chart placements, touring opportunities, and overall label confidence. This global release day, known as New Music Friday, officially began on July 10, 2015, led by the International Federation of the Phonographic Industry (IFPI).

In recent news, iconic Chicago rapper and producer Kanye West spoke out against streaming services and their payouts to artists. In leaked social media messages with a fan, West seconded songwriter and producer James Blake's recent outburst on the X platform that the rise of streaming services has negatively impacted artists in the music industry. As for West's upcoming project, Vultures 2, he has claimed that the album will only be available on his website, YZY.com, for $20. This is not the only example we have seen where artists deviate from the streaming norm in order to drive sales and satisfy their cult-like fanbases. Toronto rapper Tory Lanez took advantage of innovative Web3 technology and sold an album directly to fans through an NFT. One million copies of the album were released on a new streaming platform, E-NFT. However, no one expected them to sell out in just 57 seconds. Technically, the album is the fastest Billboard-registered platinum project of all time, but was never recognized by the organization as it carried out an atypical sales process. That is another aspect to consider when examining streaming services. These companies wield complete control over user algorithms, enabling them to display any content they intend to promote to users. This makes the music industry extremely hard to get into without a record deal with a major label, the economic concept of high barriers to entry. Anyone can technically post a song, but without marketing and promotion, no one will ever hear it. With over 60,000 new tracks being uploaded to Spotify every day, or about 22 million tracks annually, smaller or 'underground' artists have recently adapted to use social media presence, like Instagram branding and TikTok sounds, to drive organic fanbases and appeal to label A&Rs.[10]

The inverse, or large artists being purposefully excluded from streaming algorithms is true in some cases as well, leading to more negative comments from music stakeholders. An

[10] A&R stands for artists and repertoire, the division of a record label responsible for finding, developing, and representing artists. Fred Gaisberg (1873 – 1951) is considered the world's first A&R. He worked for The Gramophone Company in England and was the artistic director of HMV's international artists department.

example of this came about in 2022, when rap artist NBA YoungBoy accused his label of 'blackballing' him, otherwise described as the deliberate exclusion or suppression of someone's work by influential individuals or entities within the industry, streaming services. Youngboy resorted to dropping singles coupled with music videos on YouTube, garnering hundreds of millions of streams. When it came time to push albums onto big platforms, though, the sales were highly disproportionate relative to his YouTube attention. Fans wrote a petition to have his label, Atlantic Records, release Youngboy from his contract and return his 'masters,' the legal ownership rights to the music created while being under a label. The petition stated, "His music is not promoted by the label, and he is not assisted in any way by [Atlantic Records]...They simply sit and collect money. We need a change right now; WE are sick of labels exploiting their artists and refusing to let them out of their cheap contract that they signed when they were younger" (Rap-Up 2022). What angry fans seem to forget, though, is that music contracts are structured so that labels want to push and promote their artists' music as much as they can.

A typical recording contract looks like this: a label pays a young artist a lump sum at the beginning of their career with the expectation that they will make hit songs and drive profits. That lump sum is called an 'advance'. In most cases, the label will pay for the artist's marketing, promotion, and music distribution at every step of the recording process. The artists lock in a certain number of projects to be released under the label, and the label reaps an extremely high percentage of the streaming royalties, about 70-80%, until the advance is recouped. If two years into an artist's career, they experience a 'fall-off,' or a decline in sales, fanbase, whatever it may be, if they are no longer an asset to the label, the artist will get 'shelved,' excluding them from promotion deals, marketing budgets, and other resources granted to the superstars. This happens way more than the typical listener expects. Because our attention spans are so terrible, we never

stop to wonder what happened to the artist who made one Billboard #1 single back in 2010. The answer? They got shelved because they could not produce anything substantive from a label perspective afterward. This is especially the case with younger artists. Many superstars within the pop and hip-hop genres, the most popular genres in the U.S. as of 2024, sign to labels when they are extremely young and end up being taken advantage of. Take Chicago native Juice WRLD as an example. Juice began posting music to Soundcloud, an unpaid streaming service, when he was 17 years old. By the time he was 19, he gained a massive following for pioneering a vulnerable and emotional subgenre of melodic hip-hop. He began working with some of the biggest producers at the time and honing his craft until he was picked up by Grade A Productions under Interscope Records for a $3 million advance. Juice became one of this generation's superstars, with 9 top ten hits, 80 songs on Billboard's Hot 100, and his Sophomore album, Death Race for Love, topping the charts at #1 for two weeks.[11] The label made a great investment in Juice from a monetary value standpoint. But sadly, that is all they thought of him as. The story continues, sold-out stadiums, more hit songs, and more attention garnered to the artist, meaning more profit for the label.

On December 8th, 2019, everything changed. Jarad Higgins, Juice's real name, suddenly passed away from a drug overdose at Chicago's Midway International Airport. There is speculation that Interscope controlled the artist during his life, exploiting him for his musical talent with little concern for his well-being. There was even a story from one of Juice's ex-girlfriends saying that the label supplied him with drugs. While this claim has been refuted by an official statement from Interscope, others who worked with Juice, like engineers and producers, have subtly spoken out against the label's treatment of their artist during his time on earth. The label's tangible and blatant faults ultimately came to life after Jarad's death. They

[11] This may sound trivial, but it's really huge for a 20-year-old in the industry.

began pumping out Juice WRLD music and merchandise like an assembly line. While his first posthumous album, Legends Never Die, was undoubtedly a commemorative masterpiece, the label's scheme has been played out for everyone to see. We are now three posthumous albums in, each recognized by the Juice community as being worse than the previous. Not in terms of Juice's vocals, but the engineering, production quality, song selection, and overall rushed feel of the projects relative to their massive marketing budgets sparks criticism. The label has also released multiple singles with other artists that Juice never worked with during his life, including 'Wandered to L.A.' with pop icon Justin Bieber. Just last week, I got an email from Juice's label saying that they've collaborated with yet another graffiti artist for a merchandise line. I also recently saw a post from one of his previous managers about a "new album coming soon," most likely noting a project entitled 'Outsiders,' something that Juice was working on before his sudden death.

Clearly, Grade A and Interscope had not recouped its advance on Juice, despite his initial success. They used the time of his death to push his brand, all under the façade of maintaining his legacy. If the executives truly cared about Juice's legacy, they would not have sold his catalog to Opus Music Group back in February in a nine-figure deal that entailed 90% master income interest, 90% publishing ownership, and hundreds of his unreleased tracks. This is common within the industry, with many more examples coming to fruition as information access has increased.

Behind the instant access and global reach of music lies another harsh reality: artists are often underpaid for their creative contributions, while labels wield their power to exploit their naivety and lack of legal understanding. Another recent case of rapper Trefuego serves as another poignant example. Trefuego, known for his hit song "90mh," found himself in a legal

battle with Sony over an unlicensed sample used in his track. He was ordered to pay a $800,000 fine out of pocket, then was dropped by his label. The economics of streaming are, in some cases, skewed against musicians. This model disproportionately benefits major labels and established artists while leaving independent and up-and-coming musicians struggling to make ends meet. As I mentioned before, contract structure plays a big role in an artist's bargaining power with their label. Many young and inexperienced artists, eager to break into the industry, sign agreements without fully understanding the implications. Complex legal jargon often leaves them vulnerable, with labels retaining significant control over their music and earnings. Because of these factors, the median musician in the United States makes less than $25,000 per year, which often is not enough to live on, according to Rolling Stone.

As you may be able to tell, I was a big Juice fan. But I was able to see the bigger picture rather than just sit back and let Interscope shove his unfinished music at fans so that they could increase their streaming revenue. The point of all of this is that streaming has made the business less humane. Artists are seen as products rather than people. So many young talents suffer from anxiety, depression, and substance abuse simply because they are pushed so hard to make executives money. Yes, you could tell them "You signed up for this, literally." But young kids who once closed their eyes and imagined themselves on stage find themselves pawns in a chess game, where moving forward is the only option, and if you stop, you are put on the opponent's shelf. There are countless examples of these instances within the industry, but since this is an economics paper, I will do my best to generalize some of the negatives. Too often we find ourselves realizing the positives of innovation, and yes, I personally use Spotify for convenience, but too many turn the other cheek to any negative impact.

3.5 Negatives of the Streaming Revolution

1. Algorithmic Recommendations

Streaming platforms use algorithms to recommend music to consumers based on individual listening habits. While this can introduce more people to new artists, it also pigeonholes artists into certain genres that align with what is popular, or what labels think is streaming well. Artists feel pressure to fit into these molds for visibility.

2. Focus on Singles Over Albums

The single-oriented nature of streaming encourages artists to focus more on creating hit singles rather than cohesive albums. This culture leads to songs being viewed as standalone products rather than pieces of a larger artistic expression. Classics including Pink Floyd's 'The Dark Side of the Moon', The Beatles' 'Sgt. Pepper's Lonely Hearts Club Band,' and Prince's 'Purple Rain' showcase a unified listening experience that goes beyond individual songs, inviting listeners on a journey from start to finish. This is much less popular today.

3. Data-Driven Decision Making

Record labels and streaming platforms rely heavily on data analytics to understand consumer behavior. This data-driven approach influences decisions about an artist's image, branding, and the type of music they create. Artists feel more pressure to conform to what the data suggests is popular rather than following their creative instincts.

4. Shortened Attention Spans

With the abundance of music available at our fingertips, and the influence of short-form social media content (and a few other 'innovative' catastrophes), listeners often have

shorter attention spans. This leads to artists feeling pressure to constantly release new music to stay relevant, sometimes sacrificing quality for quantity.

5. Monetization and Royalties

Streaming has made music more accessible to listeners, but it has also raised concerns about fair compensation for artists. The per-stream royalty rates on some platforms are notoriously low, leading artists to rely more heavily on touring, merchandise sales, and other revenue streams to make a living.[12]

6. Social Media Pressure

Artists are expected to maintain a strong social media presence to engage with fans and promote their music. This creates a sense of performance and pressure to constantly portray a certain image, blurring the lines between public persona and private life.

7. Loss of Album Art and Physical Collectibles

With the shift towards digital music consumption, the physical aspect of music, such as album art, liner notes, and collectible editions, has diminished. This has contributed to the perception of music by many as a disposable commodity rather than a cherished art form.

8. Overemphasis on Streaming Numbers

The emphasis on streaming numbers as a measure of success creates a culture where an artist's worth is judged solely by their chart positions and play counts. This overshadows the overall artistry, creativity, and human aspects of the music-making process.

9. Fast-Changing Trends

Artists are now required to follow popular music trends based on data and listener attention. These trends are fast-changing and put even more pressure on creators.

[12] Representatives Rashida Tlaib and Jamaal Bowman have recently introduced a bill to the U.S. House in partnership with the United Musicians and Allied Workers Union titled the 'Living Wage for Musicians Act.' This creates a new royalty system that would bypass existing contracts and go directly from platforms to artists.

4 Conclusion

Once upon a time, in an era where vinyl records whispered and melodies danced within the grooves of discs, the music industry found itself on the brink of a magical transformation. This thesis followed a quest through the pages of musical history, tracing the evolution of music from tangible treasure to the rise of mighty streaming platforms. Through economic regression analysis, this paper sought to unravel the impact of Spotify's emergence on the fortunes of music industry players. The findings revealed a curious enchantment: the IPO announcement and arrival of Spotify to public markets did not have a significant impact on the stock prices of the music realm amidst the broader entertainment industry. Yet, a tapestry of deeper meanings lies behind these findings. The age of digital music has reshaped how we seek, share, and weave music into our lives. As Spotify soared, it brought newfound ease and wonder to listeners far and wide. It also stirred questions about royalties, market dominance, and the destiny of unsung creators. As this chapter draws to a close, this paper tells of a tale yet unfolding. The story of music's evolution, with its twists and crescendos, marches on through the ever-changing tides of time. These conclusions unlock not just Spotify's impact but also reveal glimpses of a grander saga of digital enchantment across realms.

As society navigates this ever-shifting landscape, one truth remains steadfast: music will forever hold the power to enchant, connect, and inspire untold tales. It holds the ability to touch the depths of our souls and unite the threads of human experience. In economic terms, various studies show that music can reduce stress levels, improve moods, increase energy levels, reduce pain levels, and even speed up recovery time from illness or injury (Schäfer 2013, 2017; Arjmand 2017; Leeuw 2022). And so, the silhouette of this paper fades into the night, leaving behind the promise of many more musical adventures to come.

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