

DOES SOUTH KOREA'S MELON CHART RANKING INFLUENCE K-POP ARTISTS' YOUTUBE
VIEWS?



A Thesis Submitted in Partial Fulfillment of the Requirements
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อันดับบนชาร์ตเพลงเมลอนประเทศเกาหลีได้ส่งอิทธิพลต่อยอดเข้าชม YouTube ของศิลปินเคป๊อป
หรือไม่?



วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรมหาบัณฑิต
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ฟ้าใส ทิพย์โสติกุล : อันดับบนชาร์ตเพลงเมลอนประเทศเกาหลีได้ส่งอิทธิพลต่อยอดเข้าชม YouTube ของศิลปินเคป็อปหรือไม่? (DOES SOUTH KOREA'S MELON CHART RANKING INFLUENCE K-POP ARTISTS' YOUTUBE VIEWS?) อ.ที่ปรึกษาหลัก : รศ. ดร.ยong ยูน

แม้ว่าในขณะที่ดนตรีเคป็อปจะเป็นที่แพร่หลายไปทั่วโลก ความสำเร็จของศิลปินยังคงถูกประเมินจากชื่อเสียงภายในประเทศ และท่ามกลางการแข่งขันอันเข้มข้นในอุตสาหกรรมดนตรีเกาหลีก็ทำให้หลีกเลี่ยงไม่ได้ที่ศิลปินจะคาดหวังให้เพลงของตนอยู่ในอันดับสูงบนชาร์ตเพลงภายในประเทศเพื่อเป็นที่สนใจของสาธารณชน จึงเกิดเป็นคำถามว่าศิลปินบางส่วนกำลังให้ความสำคัญกับผลงานภายในประเทศมากเกินไปหรือไม่ในขณะที่ตลาดโลกก็เป็นอีกโอกาสหนึ่งเช่นกัน งานวิจัยนี้ทำการวิเคราะห์ข้อมูลในเชิงปริมาณเพื่อทดสอบว่าอันดับบนชาร์ตเพลงเมลอนซึ่งเป็นแพลตฟอร์มสำหรับฟังเพลงที่มีจำนวนผู้ใช้งานมากที่สุดในประเทศเกาหลีได้สามารถคาดการณ์ยอดเข้าชมโดยรวมบน YouTube ของศิลปินเคป็อปได้หรือไม่ หรือในอีกความหมายหนึ่งคือความนิยมภายในประเทศสามารถคาดการณ์ความนิยมระดับโลกได้หรือไม่นั่นเอง

ผลการวิจัยไม่พบความสัมพันธ์เชิงเหตุภาพที่อันดับบนชาร์ตเพลงเมลอนคาดการณ์ยอดเข้าชมโดยรวมบน YouTube ของศิลปิน เนื่องจากยอดเข้าชมโดยรวมบน YouTube ของศิลปินแสดงนัยสำคัญในการคาดการณ์อันดับบนชาร์ตเพลงเมลอนเช่นกัน การคาดการณ์สองทางปรากฏในผลลัพธ์ส่วนใหญ่ซึ่งแสดงให้เห็นว่าความนิยมบนสองแพลตฟอร์มเคลื่อนที่ไปพร้อมกันในทิศทางเดียวกัน โดยอันดับบนชาร์ตเพลงเมลอนในประเทศเกาหลีได้ไม่ใช่ตัวชี้วัดนำที่ส่งผลต่อความนิยมระดับโลกของศิลปิน

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Although K-pop has been diffused throughout the world by YouTube and become globalized, artist's success is still evaluated by their reputation within the domestic market. Amidst the intense competition in the South Korean music industry, it's inevitable that artists would hope their songs perform well on the domestic chart as it's a way to gain public attention. Thus, it leads to the question; "Are some artists putting too much stress on the domestic performances when the global market is also an opportunity?". To answer the question, this study analyzes the data by quantitative approach to examine whether Melon chart ranking, a music streaming platform with the highest number of users in South Korea, predicts K-pop artist's overall YouTube views. In other words, whether the domestic popularity predicts the global popularity.

Results showed that there was no Granger Causality in Melon chart ranking predicting overall YouTube views as overall YouTube views also showed significance in predicting Melon chart ranking. Two-way prediction was present in most songs which means Melon chart ranking of a song and artist's overall YouTube views move along together in terms of popularity and South Korea's Melon chart ranking is not a leading indicator that brings about artists' global popularity.

Field of Study: Korean Studies

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Farsai Tipsotikul

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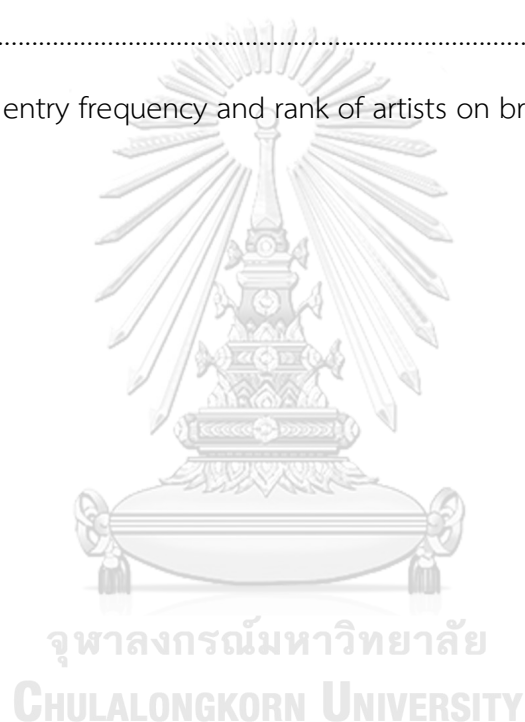
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CHAPTER I

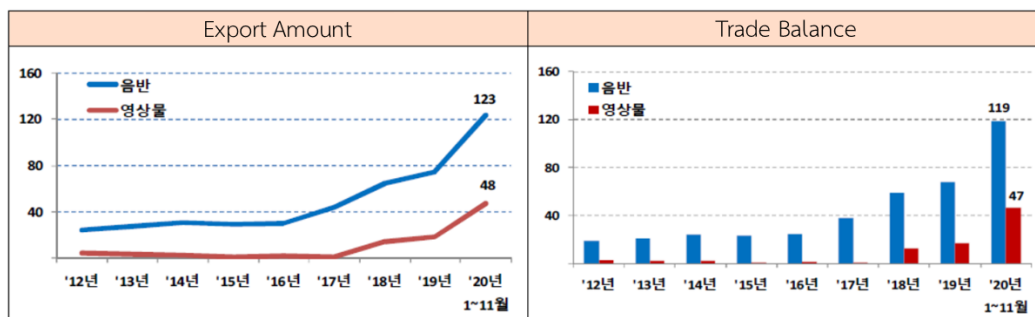
INTRODUCTION

1.1 Research background and rationale

Korean pop music value in global market

It is undeniable that Korean pop music (K-pop) has emerged to be one of popular genres in the world music market at the moment and has been generating considerable amount of revenue for South Korea. According to the Korea Customs Service, Cho and Lee (2020) reported that the export value of K-pop physical records has hit the highest record in history at 1.7 hundred million U.S. dollars in 2020 which was a 94.9% increase from the previous year regardless of the difficulty caused by a long-term situation of COVID-19. Only physical albums alone were exported to approximately 110 countries around the world and accounted for 1.23 million U.S. dollars or a 78.2% increase year-on-year. The report also stated that this high growth in export value was influenced by the fandom culture as K-pop has developed globally in which fans purchase CDs or DVDs containing K-pop artists' songs or music videos for the purpose of ownership.

Figure 1 Export amount of K-pop physical records, 2012-2020 (US\$ millions)



* Based on reported export cases of albums and videos; digital downloads and online results not included

Source: Cho and Lee (2020)

Digital music playing an important role in global music industry

Besides physical records of music, the revenue of global recorded music industry also came from the digitized form of music distribution which were downloads and streaming. Referring to IFPI database from 2001-2019, music streaming revenue grew steadily from 2015 and became the main revenue of the industry in 2017 by outperforming physical revenue and represented the biggest share of total revenue. In 2019, South Korea ranked sixth as the largest music market where the total global revenues were worth 20.2 billion U.S. dollars (IFPI, 2020).

Digitization paved the way for K-pop to global success especially YouTube

Technological development and digitization have changed the way people consume music and have been emphasized by some Korean scholars as an

explanation for K-pop's success. This explanation gives an emphasis on the change in music distribution from record producers and distributors to online-based distribution and states that the rise of online video-sharing sites such as YouTube played the most important role in globally diffusing Korean music (Shin & Kim, 2013). Digitization was the reason why online music streaming services appeared in the Korean music industry. In spite of many global players' attempt to enter the world's sixth largest music market, South Korea has been dominated by domestic providers ever since music streaming became a growing business. While music companies adjusted their management focus to online distribution in addition to physical ones, they also utilized the free-access platform like YouTube to promote new releases to global consumers which has been the gateway for globalization of K-pop and its dramatic popularity expansion. One distinct example of how extensively K-pop was diffused by YouTube is PSY's hit "Gangnam Style" released in 2012. The music video went viral around the world and became the most watched video of all time on YouTube after several years of release. By the end of July 2021, the most viewed K-pop artist on YouTube is BTS whose YouTube videos had 15.4 billion plays over the past 12 months, suggesting how vast YouTube has been diffusing K-pop to the world.

Intense competition on domestic music streaming platforms

The success of South Korean music industry comes with an intense competition among musicians especially on the domestic music streaming platforms.

It is rather hard for newly debuted artists to get their names to the audience especially if they are in a small management company and need to compete with entertainment giants or superstars in the industry. It is inevitable that artists would hope their songs perform well on the domestic chart as it's a way to gain public attention as it is potentially followed with many opportunities such as mass media appearance or commercial contracts. The intensity has raised to the extent that over the past decade, an issue concerning illegal music chart manipulation (음원 사재기) has been constantly mentioned. Although there was no solid confirmation, chart manipulation was mostly claimed to be done on the real-time chart of South Korea's largest music streaming platform, Melon. Real-time charts normally demonstrate popular songs over the past hours by counting downloads and streams which make it possible for a song to get the first rank in every hour, leading to a tricky method of illegal mass downloading or streaming whenever there is low traffic. This issue was first brought up around 2012 to 2013, however, only suspicions were remained until now as there are not enough proofs even after going through police investigations. As the real-time chart has caused unnecessary competition and led to suspicions of illegal chart manipulation, Melon has reformed its charting system in mid-2020. Instead of a real-time chart that reflects popular songs in the past hour, it is changed to a chart that reflects popular songs in the past 24 hours to reduce the competition intensity and allow users to discover a more diverse types of music.

Regardless of the change in charting system, ranking on Melon chart is still being perceived as a measurement of reputation and opportunity to gain more public attention. In the globalization era of K-pop where global performances should be crucially taken into consideration to indicate management focus, the questions “Are K-pop artists putting too much stress on the domestic streaming platform?” and “Would the reputation within the domestic market automatically lead to global reputation?” have been raised. This study will examine whether Melon chart ranking is the leading indicator for K-pop music industry to achieve global popularity or not.

1.2 Purpose of study

1.2.1 To examine whether Melon chart ranking is the leading indicator for K-pop music industry to achieve global popularity

1.2.2 To find suggestions of what artists or entertainment companies could utilize for domestic and international performance evaluation and strategy development

1.3 Research questions

1.3.1 Is chart ranking on the dominating music streaming platform “Melon” a leading indicator for K-pop music industry?

1.3.2 Is ranking on Melon an appropriate measure for success when K-pop is a global matter?

1.3.3 In which way could Korean artists or entertainment companies make benefits out of their performance on Melon chart and YouTube?

1.4 Research hypothesis

In the globalization era of Korean music industry where K-pop songs are internationalized and exported to many countries across the world, South Korea's Melon chart ranking is not a leading indicator that brings about artists' global popularity.

1.5 Scope of research

This research focuses on testing whether songs ranking on Melon weekly chart positively affects K-pop artists' global popularity observed from overall YouTube views and whether it affects songs ranking on South Korea YouTube Music (YTM). Data is collected from Melon weekly chart, South Korea YTM weekly chart, and artists' YouTube daily views to cover a 52-week period for the test.

1.6 Expected findings

Results should show that Melon chart ranking does not predict artists' global popularity measured by overall YouTube views. It could be beneficial for artists and management companies in South Korea, whether K-pop or different genres, or in

other countries with similar industry characteristics to realize the impact of ranking on a domestic chart and be able to develop business strategies that comply with their goals.

1.7 Specific terms and definition

Brand Reputation artists: K-pop artists who appeared in top 50 of the Idol Group Brand Reputation Ranking (April 2020 – February 2021) and the Singer Brand Reputation Ranking (March – April 2021)

Melon artists: K-pop artists whose song(s) entered Melon chart during April 13, 2020 – April 25, 2021

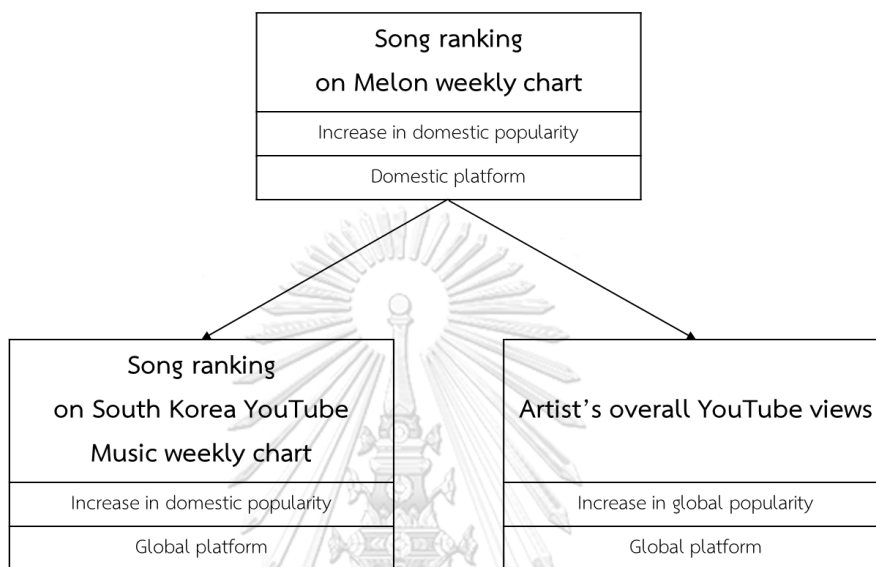
Melon-YTM artists: Melon artists whose song(s) entered South Korea YouTube Music chart during April 17, 2020 – April 22, 2021

Non-Melon artists: K-pop artists whose song(s) did not enter Melon chart during April 13, 2020 – April 25, 2021

YTM artists: non-Melon artists whose song(s) entered South Korea YouTube Music chart during April 17, 2020 – April 22, 2021

1.8 Conceptual framework

Figure 2 Conceptual framework



This research aims to examine the impact that song ranking on domestic platform, Melon, has on artist's overall (i.e., global) YouTube views and song ranking on South Korea YouTube Music. It is expected that an increase of artist's popularity on the largest domestic platform (Melon chart ranking) would lead to an increase in domestic popularity on another platform (YouTube Music chart ranking). In contrary, an increase of popularity on the largest domestic platform (Melon chart ranking) is not expected to have an impact on global popularity (artist's overall YouTube views).

CHAPTER II

LITERATURE REVIEW

2.1 Development of global recorded music industry

Online music streaming has recently been growing rapidly and continued soaring upward in global music consumption. According to Moreau (2013), music streaming service appeared in the industry as a new business model after the conventional music distribution and marketing were challenged by digitization.

For the recorded music industry, technological inventions have gradually changed the way music is distributed and promoted as shown in table 1. After the phonograph (wax cylinder) record was introduced as the birth of recorded music industry, mass promotion through radio broadcasting has been the effective channel for boosting record sales. The phonograph record has later been developed into a vinyl record, an audiocassette, and a CD. Walkman, a music record player, was also invented and made music portable. Despite these innovations, there was no impact on the distribution or promotion of recorded music as major labels and radio broadcasts still had control over such activities. It is applicable that media technologies and the structure or strategies of distribution and marketing significantly curb diversity and new genre creation through the “gate keeping” role that media technologies supposedly play in the popular music industry (Oh & Lee, 2013).

However, the rise of new music genres during the 1950s has given a challenge for major record labels as small independent companies were able to set up their own studios and recordings at affordable costs (Moreau, 2013).

Table 1 Key technological innovations in recorded music industry

Year	Innovation	Impact on distribution	Impact on promotion
1877-87	Phonograph (cylinder), gramophone	Birth of the recorded music market with the introduction of the 78rpm in 1906	
1920	Radio	None	“Star system” created by Decca in 1929 (massive use of radio broadcasting to promote record sales)
1948	Vinyl disc	None; only a change in the support	None; radio broadcasting still the dominant model of promotion. However, singles (45rpm) sales promote album sales.
1962	Audiocassette	None; only a change in the support	None
1979	Walkman	None; only introduction of listening in mobility	None
1982	CD	None; only a change in the support	None
1990s	Internet and ICT	Change in the support (digital files) and in business models (streaming, subscription)	Recommender systems, online word-of-mouth, social networks

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Reproduced from Moreau (2013)

In the 1990s, the nature of music industry has changed substantially after the technologies revolution in recorded music along with the emergence of information and communications technology (ICT) and the internet. According to Wikström (2013), it was not anymore “the old music economy” in which content was inseparable from the record or from other audio formats and the music industry was truly an

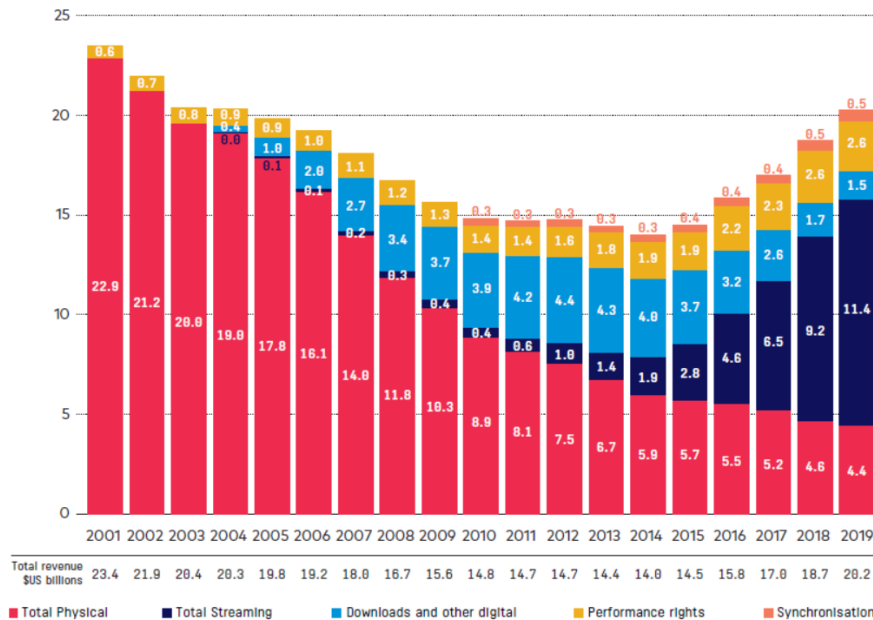
“industry of physical goods.” In 2003, Apple launched iTunes Music Store enabling digital downloads for sale. Likewise, major music labels started to offer digital downloads as a service for the sake of cost reduction in manufacturing, distribution, and promotion, while offering products to consumers at a much lower price. YouTube, founded in 2005 as a video-sharing platform, has also become the new way of music consumption. The introduction and routinization of internet have later transformed how music is consumed: from analog to digital, from offline to online, and from possessing to accessing (Parc & Kim, 2020).

After the encounter of digitization and the fact that song downloads have become another option for consuming music, online music streaming platforms, as offered by Spotify in 2008 and Apple Music in 2015, appear to be another alternative which has become a rapid growing segment of global music consumption. According to Rahimi and Park (2020), there are two different categories of music streaming service available in the global music market. The first category consists of two revenue models: an advertisement-based free model that offers free usage of features and services while generating revenue from advertisement sales, and a subscription-based streaming model that charges monthly subscription fee and lets users enjoy advertisements free streaming experience. The second category is an on-demand streaming or streaming radio. On-demand streaming allows users to browse for songs and listens to predetermined playlists while radio streaming only provides

the latter function. In short, revenue of music streaming service comes from either users or advertisements.

Digital downloads were first to pave the way before music streaming became a general way of music consumption. However, internet and development in ICT came with peer-to-peer (P2P) file sharing between consumers which allow them to possess music without having to pay the copyrights owner. Despite an increase in digital sales, the decline in physical sales could not be offset and it has brought a failed business model to the music industry as large companies were unable to control over music trading and distribution via the internet (Škoro & Rončević, 2019). There is a study in 2002 that digital downloads have negatively affected the music industry as people began to consume illegally distributed music and reduce spendings on music purchases (IFPI, 2004). As can be seen in figure 3, physical revenue and total revenue have been declining critically after revenue from digital downloads has been increasing since 2004.

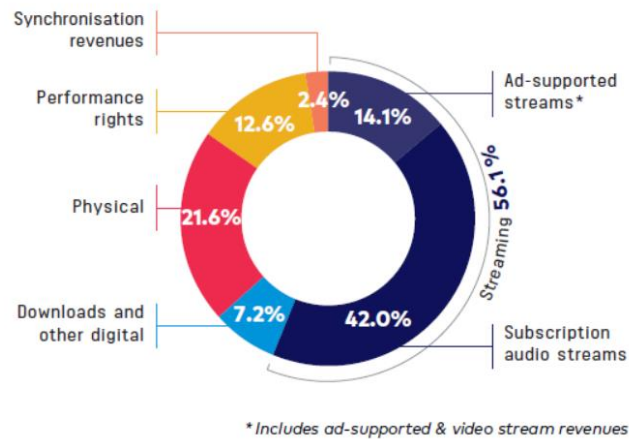
Figure 3 Global recorded music industry revenues, 2001-2019 (US\$ billions)



Source: IFPI (2020)

In recent years, music streaming has been the driving segment of the global music market growth since 2015. Figure 4 shows that 56.1% of the total global recorded music revenue came from streaming revenue which are subscription audio streams including ad-supported and video stream revenues. In a study of online music streaming impact on global music industry growth by Rahimi and Park (2020), their investigation showed that on-demand streaming services have had the largest contribution to global revenue since 2017 and predicted the exponential growth of its contribution in the following years.

Figure 4 Global recorded music revenues by segment, 2019



Source: IFPI (2020)

2.2 Digitization and Korean music industry

Along with global trend when digital downloads were becoming popular, the first Korean P2P file-sharing platform “Soribada” where users shared songs in MP3 format was launched in 2000. Unfortunately, Soribada was required by the court to discontinue its service according to the copyright infringement case filed by the Korean Association of Phonographic Producers (KAPP). Although Soribada had to shut down the file-sharing business, it returned to the market and currently provides only music streaming service. New music platforms kept paving their way into the market during the 2000s not only because the advancement in ICT but also the household broadband penetration in which South Korea has had a considerably fast 3G mobile technology and a higher broadband penetration rate compared to other OECD countries. In 2003, broadband penetration rate in South Korea was nearly 80% while

Taiwan and Canada followed at about 50% and 35% respectively (IFPI, 2004). The IFPI online music report based on 2003 data showed that mobile networks and devices could become the key distribution platform for music as this sector has been partnering up with mobile operators and music companies while providing users with streaming and sampling new music. As an evidence, today's largest Korean music streaming platforms are Melon and Genie which were developed by South Korea Telecom (SKT) and KT Corporation (former Korea Telecom) respectively.

2.2.1 Korean music streaming market

Korean music streaming market is mostly dominated by domestic service providers. Even though Apple Music has been successful globally by having over 15 million subscribers after launching in 2015, they gained merely 1% of the market in South Korea as Korean songs catalog were limited. An analyst based in Seoul stated that “the service has failed to make its presence felt probably due to a lack of music content in a market ruled by a handful of homegrown players.” The leaders in Korean music streaming market, Melon and Genie, have been dominating the market since their appearances in the industry and take up over half of the market share. According to the data collected from iOS and Android users by IGAWorks (2020), Melon had 8.81 million monthly active users (MAUs) in October 2020 which accounted for 42.5% among seven main service providers. Genie followed by 4.47

million MAUs or 21.6%, making up to over 60% of the market share when combined with Melon.

Table 2 Monthly active users of main music streaming service providers in South Korea based on iOS and Android users, October 2020

Service Provider	Owner / Country	Monthly Active Users (million)	Monthly Active Users (%)
Melon	Kakao M / South Korea	8.81	42.5
Genie	KT / South Korea	4.47	21.6
FLO	SK Telecom / South Korea	2.86	13.8
YouTube Music	Google / USA	2.41	11.6
Kakao Music	Kakao / South Korea	0.80	3.9
VIBE	Naver / South Korea	0.75	3.6
Bugs	NHN / South Korea	0.64	3.1
Total		20.74	100.0

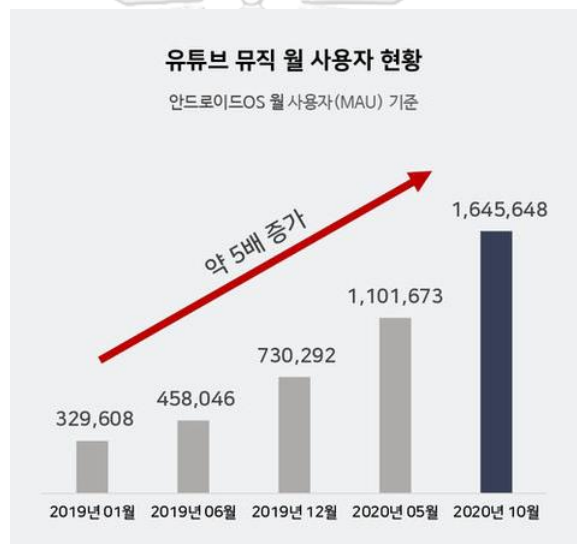
Source: IGAWorks (2020)



As the sixth largest music market in the world in 2018 and 2019, South Korea is attractive enough that global streaming service providers have been trying to take part in. Spotify, the world's no. 1 music platform, launched its service in South Korea in February 2021. However, some Korean songs in the catalog are not all available due to conflicts with local distributors which is similar to Apple Music's case. On the other hand, Google launched YTM in South Korea in 2018 with a free subscription first then later offered a paid subscription for an ad-free service with YTM Premium in

2020. Referring to the data as of October 2020 shown in table 2, YTM ranked fourth in the market with 11.6% share. IGAWorks reported that YTM MAUs increased approximately five times during January 2019 and October 2020 based on Android users in South Korea.

Figure 5 Growth of YouTube Music monthly active users based on Android users, January 2019 – October 2020



CHULALONGKORN UNIVERSITY

Source: IGAWorks (2020)

The growth of YTM users is not much of a surprise. Sohn (2018) reported on The Korea Herald that one thousand people answered about their mobile service usage patterns and application preferences on the “Mobile Service User Behavior Survey” conducted by the Korea Internet Corporations Association even before the launch of YTM. The result showed the most frequently engaged activities as follow;

watching videos (87.5%) and listening to music (73.9%). 43% of the respondents said YouTube was the main application they used for enjoying music, while Melon came in second with 28.1%.

Changes in Korean music streaming industry has been visible as new players kept coming in to challenge the market leaders. Based on IGAWorks' report, Melon had 5.98 million MAUs in October 2020 which is a 19.5% decrease from that in January 2019. Meanwhile, FLO's MAUs increased 62.5% to 2.04 million MAUs during the same period. Now that Spotify has entered South Korea, people are paying a close attention to the music streaming market whether the newcomers would be able to compete with former market dominators.

Table 3 Changes in monthly active users of Melon, Genie, and FLO based on Android users, January 2019 – October 2020

Service Provider	Monthly Active Users in Oct 2020 (million)	% Increase (Decrease) from Jan 2019
Melon	5.98	(19.5)
Genie	3.04	11.9
FLO	2.04	62.5

Source: IGAWorks (2020)

2.2.2 Korean pop music (K-pop) goes global thanks to YouTube

Korean pop music or K-pop as known by the world today has started in the 1990s when new music genre has replaced former ones that Korean people considered “popular music.” With the introduction of an American-style dance hip-hop music and performance by Seo Taeji and Boys in 1992, their songs became a nationwide hit with 1.7 million albums sold and remained at top-selling position for 17 weeks (Lie, 2015). After the former mainstream popular music like ballad or trot was replaced by music and performance that consist of singing, rapping, and dancing which were similar to American popular music, it was the beginning of a music genre called K-pop.

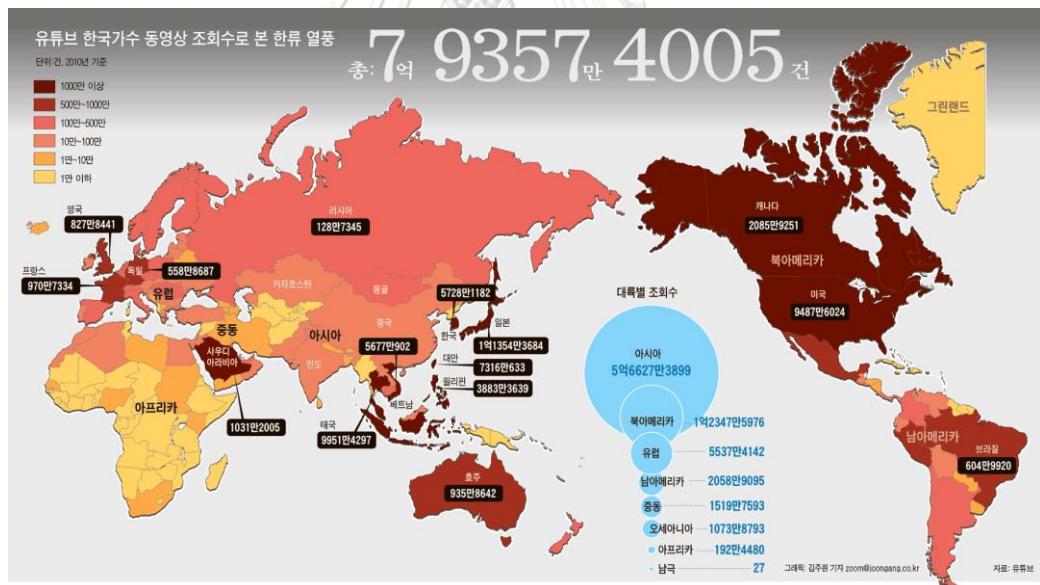
However, K-pop in a Korean way started with the debut of a boy group named H.O.T. (High Five of Teenagers) in 1996 which came with the culture of fandom, management labels, and K-pop idol system. K-pop began to be exported to other Asian countries such as China, Japan, and Southeast Asian countries in a form of South Korean cultural product which was a result of the Korean wave or Hallyu (한류), the trendiness of Korean popular culture originally kicked off by TV dramas. In the 2000s, entertainment labels started attempting for international popularity mostly by starting overseas ventures as subsidiaries and partnering up with foreign entertainment companies as well as record distributors (Shin & Kim, 2013). Before an advanced development of technology and internet, artists could only travel overseas by themselves, hold showcases, release albums, and have promotion activities in

one country at a time. Thanks to the birth of YouTube in 2005, K-pop was able to reach more audiences through internet access not only in Asia but also North America, South America, and Europe. Parc and Kim (2020) stated that music producers have changed from only producing audio sound to also create visual images when internet has become routinized in people's lives. Visual images have been integrated with music since televisions were still in black and white, then pushed to a further integration especially by the dedicated U.S. music channels like MTV as music videos seemed more appealing with storylines. K-pop music video production puts an excessive amount of effort not only to its story but also the performance, costumes, and the artist's visuals. With the globalization-localization-globalization process in K-pop production according to Oh and Park (2012) which are sourcing global producers (global input), refining the artists by an in-house training (local manufacturing), and delivering the outcomes through global distributors (global distribution), YouTube helped K-pop showcase its specific characteristics and catch the attention of global audiences successfully by acting as a global distribution platform.

Based on a JoonAng Ilbo article written by Jung (2011), 923 videos by Korean artists from the three largest K-pop entertainment labels (SM Entertainment, JYP Entertainment, and YG Entertainment) were watched in 229 countries with about 800 million views throughout 2010. Figure 7 shows YouTube views of K-pop videos in different regions and countries. From the total of 793 million views, Asia came in first

with 566 million views followed by North America (123 million views) and Europe (55 million views). K-pop videos were most viewed in Japan at 113 million views, followed by Thailand (99 million views) and the United States (94 million views). The article reported that there were also numerous view counts from Egypt (630 thousand views) and Kuwait (410 thousand views) in the Middle East, and less familiar countries such as Montenegro (22 thousand views) or Guadeloupe (10 thousand views).

Figure 6 Global YouTube views of K-pop videos, 2010



Source: JoongAng Ilbo (Jung, 2011)

In 2012, K-pop’s another level of breakthrough was when “Gangnam Style” by PSY went viral and became the first YouTube video ever to reach one billion

views after hitting this milestone in five months since its release. Son (2012) wrote in Chosun Media article that investment in internet marketing such as YouTube and iTunes by YG Entertainment, PSY's management label at that time, is the reason behind this success. Before the global hit of PSY, YG Entertainment has already been working hard on the internet marketing by putting efforts in music videos of their artists such as BIGBANG and 2NE1 which would be spread quickly and impress the audiences around the world after being released on YouTube. Yang Hyeon Seok, CEO of YG Entertainment, told in the article that it was all thanks to the internet for raising BIGBANG and 2NE1's popularity in France, England, and other countries in Europe where they did not have an official promotion activity even once.

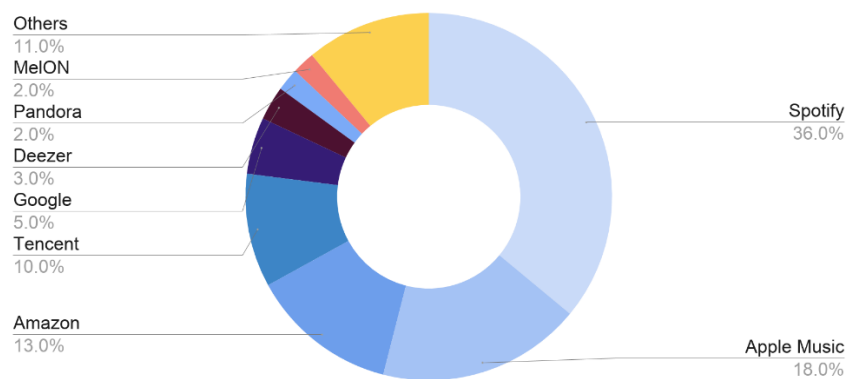
According to Oh and Lee (2013), K-pop has been given a niche market on YouTube since other distributors of J-pop or American pop avoided using this platform because of royalty fees, but K-pop producers have no other channel to distribute their music as YouTube is free and has few institutional bias or censorship against particular genres. YouTube is also a platform that provides K-pop fans with free streaming views which have been hitting higher records. By July 2021, the most viewed K-pop artist on YouTube is BTS whose YouTube videos had 15.4 billion plays over the past 12 months, suggesting how vast YouTube has been diffusing K-pop to the world. According to Crichton (2020), Google said in one of its statements that top 25 Korean bands on YouTube are receiving 90% of their views from outside of the

country. Since the start of operation, YouTube has been and is still playing an important role for K-pop in being a global distribution platform.

2.3 Charts on Korean VS global music streaming platforms

As digitization and the development of internet have transformed the way people consume music towards online streaming, there are various music streaming service providers in the global market currently. In spite of many global players' attempt to enter the world's sixth largest music market, South Korea has been dominated by domestic providers ever since music streaming became a growing business. Each platform has different services and contents for attracting users, this section will look at those of South Korea together with top global platforms.

Figure 7 Worldwide music streaming market share, 2019



Source: T4 (2021)

Although the largest market share of music streaming goes to Spotify, Apple Music, and Amazon as shown in figure 7, YouTube should also be considered one of the top destinations for enjoying music. As of October 2020, 42 of the top 50 YouTube most-viewed videos of all time are in the form of music videos. Among the top 10 include those from the world-famous artists such as Ed Sheeran, Bruno Mars, and PSY. YouTube is also the second most popular search engine on the web (Alexa, 2021) with over one billion hours of videos watched per day (Goodrow, 2017). Therefore, it is crucial to consider YouTube as one of the music streaming platforms. As YouTube replaced Google Play Music with YTM in 2015, both YouTube and YTM will be included to the comparison.

Although music streaming services commonly provide song popularity charts to let consumers know what songs are trending, global platforms do not have real-time charts like most Korean platforms. Spotify and Apple Music as top platforms of the world's first and third largest music market, the US and UK, provide daily charts as the most frequent chart update. LINE MUSIC as the biggest domestic platform in Japan, the world's second largest music market, does provide its users with real-time charts. However, music streaming in Japan contributed less than one-fifth of the industry turnover while CDs and vinyl made up over two-thirds of annual revenues in 2020 (Ingham, 2021), implying how the competition in music streaming market would not be as heated as in physical records market for Japan. There was no incentive for Japanese consumers to subscribe to their favorite artists' channel on streaming

platforms since they already had the CD or had downloaded the music, said Tetsutaro Ono, President and CEO of AWA, another top music streaming platform in Japan (Avex, 2020). Therefore, it could be implied that high competition on music streaming platform is a unique characteristic of South Korea's music industry.

Table 4 Comparison of global and Korean music streaming services



	Spotify	Apple Music	YouTube	YouTube Music	Melon	Genie	FLO
Country of origin	Sweden	U.S.A.	U.S.A.	U.S.A.	South Korea	South Korea	South Korea
Service launch	2008	2015	2005	2015	2005	2012	2015
Available countries	170	167	100+	95	1	1	1
Subscription services	Free and paid subscription	Paid subscription	Free and paid subscription	Free and paid subscription	Paid subscription	Paid subscription	Paid subscription
Monthly Active Users	345 million (Spotify, Feb 2021)	72 million (Statista, Jun 2020)	2 billion (YouTube, Feb 2021)	30 million (Google, 2020)	8.81 million (IGAWorks, Oct 2020)	4.47 million (IGAWorks, Oct 2020)	2.86 million (IGAWorks, Oct 2020)
Real-time charts	X	X	X	X	X	O	X
Daily charts	O	O	X	X	O	O	X
Weekly charts	O	X	O	O	O	O	X
Monthly charts	X	X	X	X	O	O	X

Table 4 shows information of top global music streaming platforms and market leaders in South Korea. The most common charts are daily and weekly charts while the least common is real-time charts which are provided only on Korean platforms. Genie is the only one among top three services in South Korea who provides real-time charts that update hourly to show what songs are the most

streamed and downloaded in the previous hour. In fact, Melon and FLO also had real-time charts with previous-hour data reflection before changing their chart reflection method in 2020. Real-time charts on Melon and FLO were replaced by 24-hour charts that reflect popular songs in the past 24 hours. According to TechWorld News article by Lee (2020), FLO has differentiated itself by coming up with a unique chart called “FLO chart” using artificial intelligence (AI) and machine learning algorithms to create a chart full of songs that match each user’s music taste based on the songs they play and press like. Both Melon and FLO stated that the purpose of removing real-time charts is to alleviate the competition intensity in Korean music industry and to prevent an abnormal method of entering the chart, known as an illegal chart manipulation which has been controversial for many years.

2.3.1 Melon real-time chart and Korean artists popularity

It is certain that chart ranking indicates how popular a song is since it represents how often the song has been streamed and downloaded. South Korean consumers are interested in the artists whose songs are on the top rankings than those in the bottom or with no chart entry, especially rankings on the largest music streaming platform in South Korea like Melon. It is inevitable that artists would hope their songs perform well on the domestic chart as it is a way to gain public attention. Although it does not guarantee that charting on Melon comes with sustainable success, it is worthy to rise on the trend as music is a fashion-oriented product which

includes features of social utility that satisfy interpersonal needs (Chen et al., 2008), which can be implied that people will adopt the trending music in order to have an individual identity relative to others.

There are numerous cases in which Korean artists happened to gain popularity once their songs entered music charts, especially Melon, at a high rank after not having good results around the time of its release. This phenomenon is known as the “reverse-charting (역주행)” which has given many artists the opportunity not only in music but also in entertainment industry. One of the cases was the song “Bar Bar Bar” by a five-member girl group, Crayon Pop. According to ChosunMedia (2013), “Bar Bar Bar” was rising rapidly to no. 10-20 rankings on nine different music charts in South Korea including Melon after spending a month being out of top 100 since its release in June 2013, and it also ranked no. 2 on Billboard Korea K-Pop Hot 100. In a Billboard article, Benjamin (2013) gave background of a typical K-pop song that it would hit its peak during the first or second week of release as most artists usually roll out their new song and music video all at once with live performances quickly following. Therefore, the case of “Bar Bar Bar” was considered a reverse-charting. Since Crayon Pop created a new craze in South Korea, “Bar Bar Bar” music video has surpassed two million views on YouTube in less than two months while the video also had big TV exposure and parodies from local celebrities. Lee (2013) informed through Maekyung Media that Crayon Pop has signed a strategic partnership agreement with Sony Music Entertainment Korea, the global

record company, and planned to enter overseas market as correlated to Sony Music's goal to expand K-pop business. "Crayon Pop has enough potential to become the second PSY. We decided to actively push forward their overseas market entry," said Sony Music representative. In 2014, Crayon Pop continued having the popularity as their new song peaked at no. 14 ranking on Melon chart. They also performed the opening show at 12 cities of Lady Gaga's concert tour (Billboard, 2014). Unfortunately, Crayon Pop stopped the group activity and parted ways in 2017 due to the contract expiration with their label.

Another example of the reverse-charting case is "Up & Down" by a five-member girl group, EXID. The group released "Up & Down" in August 2014 and wrapped up promotion on music programs while not charting within the top 100 ranking on music charts. In November of the same year, "Up & Down" unexpectedly entered the top 100 ranking on Melon real-time chart and climbed up to no. 1 in December. EXID was able to catch the public attention thanks to a fancam (video filmed by fans) of one member while performing "Up & Down" which was uploaded on YouTube in October and went viral on South Korean social networks, hitting four million views during the same period that it topped the chart. After being recognized from the viral video, EXID got the opportunity to show their abilities through music programs, radio broadcasts, variety shows, and so on. Kim (2015) wrote on Chosun Media that there were many reactions saying "Up & Down" is a good song after hearing it, and the member's ability was unveiled through many media broadcasts

after being left idle. EXID's following releases also received continuous popularity by ranking in the top 10-30 on Melon chart until the last album promoted under their label before the contract ended in 2018.

When a song by unfamiliar artists suddenly rises on Melon real-time chart and gets recognized by the public like two cases mentioned above, it often gets suspected of using an abnormal method to enter the chart known as the "chart manipulation (음원 사재기)" as it is not easy to compete with artists who are already popular or hit songs at a specific moment. However, music chart manipulation is still left as suspicions as there are not enough proofs of doing so.

2.3.2 Suspicions of music chart manipulation on Korean platforms

Real-time charts could be viewed as an exceptional characteristic of Korean platforms as they are provided on none of the top global ones, and that could be the reason behind a heated competition among South Korean artists. As real-time charts update the data hourly to show the most streamed and downloaded songs within the previous hours, it gives the opportunity for any songs to rank first at least once during one hour in a day. The expected popularity and career opportunity that come with topping the chart are viewed as incentives in causing the suspicions of chart manipulation.

The term "music chart manipulation" as given definition by BBC (2020) is the action of manipulating the chart ranking of a specific artist by paying service fee to a

broker. As mentioned before that chart ranking on typical South Korean real-time charts reflect song streams and downloads in the previous hour, it is possible for a song to climb up the chart by having a thousand devices playing it on repeat and hoarding downloads when there is less organic streaming on the platform to compete with. During the Fairness of Online Music Charts and Broadcasted Audition Programs Seminar hosted by the Korea Creative Content Agency in December 2019, an official from FLO's service operator said, "high scores on music charts could open the way for artists to earn higher concert and commercial advertisement income, as well as secure an overseas market entrance," reported Yonhap (2019). However, using irregular method to enter the chart affects other fellow artists as Genie's official stated at the seminar that "unjustly marketed songs on music charts eventually pocket the profits that should have gone to other artists, resulting in major unfair practice." Prior to this seminar, a member of K-pop boy group, Block B, shared on his personal social network platform about chart manipulation by other artists, sparking controversy among the public. However, industry experts agreed that it is hard to prove an illegal music chart manipulation and no one has been practically punished under the law on promotion in music industry regarding stockpiling music CDs, downloads, and streams. Nonetheless, BBC (2020) has made a judgement in its article that there are three things needed to find out about the existence of chart manipulation: a proposal of chart manipulation and payment made or received, an evidence of manipulation being carried out, and a result corresponding with the

proposal. Although these three factors are reported to be existing, prosecutorial investigation must be conducted to find out the truth. However, the result is still inconclusive.

2.4 Song survival on charts and charting effects

There are many factors that make a particular song survive on music charts. As music is a typical experience good that consumers recognize its value after consumption (Nelson, 1970), evaluation of its quality requires a personal experience. As of July 2021, Spotify has over 70 million songs on its catalog. This overwhelming numbers of songs on the platform means it's impossible for consumers to find songs that match with their music taste by personally going through all of the existing songs. Therefore, the existing playlists or charts are what they rely on to either reduce their risk of encountering bad choices or enable them to follow the trends (Im et al., 2018). A study on survival analysis of songs on digital music platform by Im et al. (2018) tested weekly top 100 songs on Korean music charts from 2011 to 2014 to find success factors for music in download and streaming services. Results showed that lower debut rank has significant negative effect on the song's survival time, hence, a song that debuts in higher rank tends to stay longer on the chart since consumers rely on ranking information when they have too many choices of offered songs. The idea that South Korean consumers are interested in the artists whose songs are on the top rankings can be supported by FLO's analysis of the streaming

data in the first quarter of 2020. According to the data, 24.8% of its three million subscribers listened to only one song, 14.5% listened to two songs, and 9.9% listened to three songs on the top 100 chart (Jung, 2020) on Digital Today. FLO also emphasized the consumption behavior of its users where they play songs by the chart order. Patterns of deleting or skipping songs that do not match their taste on the playlist and editing the top 100 chart to match with their own preferences were also reported. After removing real-time charts from its platform in March 2020, FLO revealed that there was a decrease in fluctuation of ranking and a 7% increase in playing songs through the whole chart approximately.

Spotify, the largest global music platform, does not have real-time chart ranking like most Korean platforms do. It instead offers daily and weekly charts as well as various kinds of playlists created by Spotify editors. Although popularity charts and curated playlists are not created by the same systemic process, they influence listeners on consumption decisions with the selected songs. Aguiar and Waldfogel (2018) examined the effect of Spotify charts and playlists and found that the platform-operated playlists have considerable and significant impacts on streaming. In the meantime, inclusion on the curated playlist for song discovery also substantially raises the probability of song success. Based on the findings, being on an algorithmically generated playlist like the Global Top 50 list raised a song's streams by about three million. Meanwhile, ranking no. 1 on the U.S. New Music Friday list raised a song's streams by about 14 million. New Music Friday playlist is a

curated selection of the most anticipated new tracks of the week which differs in 43 versions worldwide with 3.5 million followers in the U.S. and 8.5 million globally (Spotify, 2020). This study has proved that major global playlists raise streams for prominent songs substantially.

Like global platforms, Korean music streaming platforms also have a part in influencing consumers' choices by chart presentation. As a result, there are times when people are suspicious of chart manipulation. However, now that Korean music especially K-pop has been globalized and reached a large number of audiences across the globe, should artists rely mainly on Melon chart to evaluate their performance? Does Melon chart ranking influence their global reputation that K-pop artists should take the opportunity to gain after globalization? This study will explore whether Melon weekly chart ranking predicts the artist's overall YouTube views (global impact) and the song's ranking on YTM chart (domestic impact).

CHAPTER III

METHODOLOGY

This chapter introduces and elaborates the methodology used for data analysis, data sources, and collection criteria for this research.

3.1 Research design

This research consists of quantitative approach in purpose of indicating characteristics of K-pop music consumption on Korean music streaming platform and on global platform to examine whether domestic popularity predicts artist's global popularity. Relevant information was collected from credible sources such as previous studies, Korean and English news articles, official websites, and big data analyses. This research focuses on two tests: Melon chart ranking predicting overall YouTube views of K-pop artists (global impact), and Melon chart ranking predicting South Korea YTM chart ranking (domestic impact).

3.2 Data collection

It requires both primary and secondary data to conduct this research. Primary data was collected from music charts and statistics while secondary data was collected from literature sources.

3.2.1 Primary data

Main part of this study is to test a one-year period data from April 2020 to April 2021. There are three data sets as shown in table 5.

Table 5 Testing data sets

Data	Unit	Market	Platform	Source
Melon weekly chart ranking	Rank	South Korea		Melon (melon.com)
YTM weekly chart ranking	Rank	South Korea	Global	YouTube (charts.youtube.com)
Overall YouTube views	Views	Global		

Rankings on Melon weekly chart were collected from Melon’s website, while rankings on YTM weekly chart and overall YouTube views of artists whose songs entered the charts were collected from YouTube’s Music Charts & Insights. The criteria in which artists to select from Melon and YTM weekly charts is based on the Idol Group Brand Reputation Ranking¹. According to Hwang (2018), the term “idol” refers to K-pop artists who are characterized by the highly manufactured star system that they are produced by and debuted under, as well as their tendency to represent a hybridized convergence of visuals, music, fashion, and dance. This study focuses on K-pop artists as they show concrete evidence of globalization. Songs by all artists who ranked within top 50 of the Idol Group Brand Reputation Ranking

¹ A monthly ranking analysis of idol groups (K-pop artists) conducted by the Korea Brand Reputation Center

during the research period were collected. However, due to unavailable data provided by the Korea Brand Reputation Center in March and April 2021, artists who are considered idol groups that ranked on the Singer Brand Reputation Ranking² were collected as substitution.

3.2.2 Secondary data

Information from reliable secondary sources of relevant topics was collected from previous studies, academic journals, Korean and English news articles by Korean and global media, company's official websites, Korean research centers, and Korean big data analyses. Information could be categorized by topics as follow:

- Global export value of Korean music related products
- Development and trend of global recorded music consumption
- Effects of digitization on global and Korean recorded music industry
- Special characteristics of Korean music streaming platforms
- Korean consumer decision behavior when consuming music
- Competition intensity in Korean music industry that leads to suspicions of

illegal chart manipulation

- Positive effects when a song is on music charts algorithmically and selectively

² A monthly ranking analysis of South Korean singers (all genres) conducted by the Korea Brand Reputation Center

3.3 Research instruments

The purpose of this research is to examine whether music chart ranking on Korean platform (Melon chart ranking) predicts artist's global popularity (overall YouTube views) and domestic popularity (YTM chart ranking). Therefore, regression analysis was used to test for Granger causality³. Besides, a test of overall YouTube views predicting Melon chart ranking was run to see whether a reverse effect existed. Equations for all tests are as shown in table 6.

Table 6 Equations for regression analysis

Analysis	Equation
Simple regression analysis of Melon chart ranking predicting overall YouTube views	$YouTube_t = b_0 + b_1 Melon_{t-1} + e$
Simple regression analysis of Melon chart ranking predicting YTM chart ranking	$YTM_t = b_0 + b_2 Melon_{t-1} + e$
Simple regression analysis of overall YouTube views predicting Melon chart ranking	$Melon_t = b_0 + b_3 YouTube_{t-1} + e$

3.4 Analysis and presentation of data

The collected data was analyzed based on regression results while referring to literature reviews for reasonable interpretation. Results are shown in table of texts

³ A statistical hypothesis test for determining whether one time series is useful for forecasting another

and numbers. The findings of this study could allow artists or music companies to formulate appropriate self-evaluation or strategies for emerging K-pop business in the global market.



CHAPTER IV

DATA ANALYSIS

The purpose of this chapter is to present and analyze regression results of the collected data based on statistical evidence and other related information. Data was collected from Melon and YouTube official statistics from April 13, 2020, to April 25, 2021, to cover a one-year period for the test. As explained in 3.2.2 regarding data collection, target artists of this study are those who ranked on top 50 of the Idol Group Brand Reputation Ranking during the test period which is April 2020 to April 2021. However, due to unavailable data provided by the Korea Brand Reputation Center in March and April 2021, artists considered idol groups who ranked on the Singer Brand Reputation Ranking were collected as substitution. 92 Brand Reputation artists collected from top 50 on the Idol Group Brand Reputation Ranking and all that appeared on the Singer Brand Reputation Ranking are listed in table 7. Due to the constraint that a song needs at least three weeks of Melon chart entry to be valid for regression analysis, data used for regressions contains 61 songs by 20 artists from 13 labels as shown in table 8.

Table 7 Brand reputation artists

(G)I-DLE	BLACKPINK	EXO	LOONA	SECHSKIES	TVXQ!
1TEAM	Bling Bling	f(x)	Lovelyz	SECRET NUMBER	TWICE
2AM	BLOCK B	FIESTAR	MAMAMOO	SEVENTEEN	TXT
2PM	Brave Girls	fromis_9	MIRAE	SF9	VERIVERY
3YE	BTOB	GFRIEND	MOMOLAND	SHINee	VICTON
AB6IX	BTS	Girl's Day	MONSTA X	SHINHWA	VIXX
aespa	BUSTERS	Girls' Generation	NCT	STAYC	Wanna One
AlphaBAT	Cherry Bullet	Golden Child	NOIR	Stellar	Weeekly
ANS	cignature	GOT7	NU'EST	Stray Kids	Weki Meki
AOA	CIX	GWSN	OH MY GIRL	Super Junior	WINNER
Apink	CLC	Highlight	ONEUS	T1419	WJSN
APRIL	CRAVITY	HOTSHOT	ONF	T-ARA	woolah!
ASTRO	DIA	INFINITE	PENTAGON	TEEN TOP	
ATEEZ	Dreamcatcher	ITZY	Red Velvet	THE BOYZ	
B1A4	ENHYPEN	IZ*ONE	Rocket Punch	TREASURE	
BIGBANG	EVERGLOW	KINGDOM	ROMEO	TREI	

Table 8 List of songs, artists, and labels used for regression analysis

Label	Artist	Song Title
Brave Entertainment	Brave Girls	Rollin'
		We Ride
Cube Entertainment	(G)I-DLE	DUMDi DUMDi
		HWAA
		Oh my god
DSP Media	APRIL	LALALILALA
HYBE Labels (former Big Hit Entertainment)	BTS	00:00 (Zero O'Clock)
		Black Swan
		Blue & Grey
		Boy With Luv (Feat. Halsey)
		Dis-ease
		Dynamite
		Filter
		Fly To My Room
		Friends
		Inner Child
Interlude : Shadow		

Label	Artist	Song Title
		Life Goes On Louder than bombs Moon My Time ON Outro : Ego Respect Savage Love (Laxed - Siren Beat) (BTS Remix) Spring Day Stay Telepathy UGH! We are Bulletproof : the Eternal
JYP Entertainment	ITZY	Not Shy WANNABE
	TWICE	I CAN'T STOP ME MORE & MORE
Off the Record Entertainment & Swing Entertainment	IZ*ONE	FIESTA Panorama Secret Story of the Swan
Play M Entertainment	Apink	Dumhdurum
Pledis Entertainment	SEVENTEEN	Left & Right My My VERY NICE
RBW	MAMAMOO	AYA Dingga HIP
SM Entertainment	aespa	Black Mamba
	EXO	1 Billion Views Obsession
	NCT 127	Kick It
	NCT DREAM	Ridin'
	Red Velvet	Monster Psycho
	SHINee	Don't Call Me
Source Music	GFRIEND	Apple
WM Entertainment	OH MY GIRL	Dolphin Nonstop
YG Entertainment	BLACKPINK	Bet You Wanna (Feat. Cardi B)

Label	Artist	Song Title
		How You Like That Ice Cream (with Selena Gomez) Lovesick Girls Pretty Savage
	WINNER	Hold

4.1 Melon chart ranking predicting overall YouTube views

Simple regression for analyzing whether Melon chart ranking predicts overall YouTube views is run by the equation [$YouTube_t = b_0 + b_1 Melon_{t-1} + e$] on three categories of regressors: song, artist, and label. b_1 should be negative numbers if there is prediction as the higher the rank (small number), the higher the views are gained (large number).

4.1.1 Results by song

After running a simple regression of total 61 songs by 20 artists, results are as shown in table 9. As Melon chart ranking is based on weekly data, “days released” of the song is counted from its release date to last day of the first week on chart during the test period.

According to Jenkins and Quintana-Ascencio (2020) regarding minimum sample size for regressions, it is suggested that a minimum $N = 8$ is informative given very little variance, but a minimum $N \geq 25$ is required for more variance. As an average sample size of all songs used for regressions is approximately 18, $N \geq 8$ was

compromised as suitable for this study. Sample sizes of regression results by song are shown in table 10.

Table 9 Results: Melon chart ranking predicting overall YouTube views (by song)

Artist	Song Title	N (weeks)	b_1	Sig.	Days Released
(G)I-DLE	DUMDi DUMDi	20	-1.30E+05	*	6
(G)I-DLE	HWAA	11	-7.81E+04	**	6
(G)I-DLE	Oh my god	5	-6.16E+04	-	13
aespa	Black Mamba	14	-1.23E+05	-	12
Apink	Dumhdurum	27	-5.71E+04	***	6
APRIL	LALALILALA	4	-2.50E+04	-	11
BLACKPINK	Bet You Wanna (Feat. Cardi B)	5	-2.37E+06	**	9
BLACKPINK	How You Like That	42	-1.37E+06	***	2
BLACKPINK	Ice Cream (with Selena Gomez)	15	-5.72E+05	*	2
BLACKPINK	Lovesick Girls	28	1.84E+06	-	2
BLACKPINK	Pretty Savage	11	-2.29E+06	-	9
Brave Girls	Rollin'	6	3.26E+03	-	1461
Brave Girls	We Ride	4	-5.20E+05	-	219
BTS	00:00 (Zero O'Clock)	29	-9.51E+05	*	58
BTS	Black Swan	27	1.66E+06	-	58
BTS	Blue & Grey	10	2.53E+05	**	9
BTS	Boy With Luv (Feat. Halsey)	52	1.18E+06	-	373
BTS	Dis-ease	3	-2.89E+05	-	9
BTS	Dynamite	34	-8.64E+05	-	2
BTS	Filter	25	-1.34E+05	-	58
BTS	Fly To My Room	9	3.87E+05	-	2
BTS	Friends	27	1.70E+06	-	58
BTS	Inner Child	14	1.42E+06	-	58
BTS	Interlude : Shadow	13	-3.23E+05	**	58
BTS	Life Goes On	21	-2.16E+05	-	2
BTS	Louder than bombs	13	-3.74E+04	**	58
BTS	Moon	27	-4.07E+05	-	58
BTS	My Time	19	1.04E+06	-	58
BTS	ON	47	-1.05E+06	-	58
BTS	Outro : Ego	13	-1.81E+05	**	58
BTS	Respect	11	-1.35E+05	***	58

Artist	Song Title	N (weeks)	b_1	Sig.	Days Released
BTS	Savage Love (Laxed - Siren Beat) (BTS Remix)	27	7.92E+04	-	9
BTS	Spring Day	52	-3.82E+05	-	1161
BTS	Stay	3	-1.48E+05	-	9
BTS	Telepathy	3	-4.99E+05	-	9
BTS	UGH!	13	4.38E+05	-	58
BTS	We are Bulletproof : the Eternal	20	1.41E+06	-	58
EXO	1 Billion Views	4	-3.09E+05	-	6
EXO	Obsession	9	1.48E+05	-	144
GFRIEND	Apple	3	-1.16E+05	-	6
ITZY	Not Shy	16	-2.88E+05	***	6
ITZY	WANNABE	25	6.59E+04	-	41
IZ*ONE	FIESTA	26	-6.88E+04	-	62
IZ*ONE	Panorama	18	-4.93E+03	-	6
IZ*ONE	Secret Story of the Swan	14	-5.69E+04	***	6
MAMAMOO	AYA	7	-8.71E+04	-	5
MAMAMOO	Dingga	25	-1.70E+05	***	5
MAMAMOO	HIP	32	1.63E+05	**	157
NCT 127	Kick It	3	-5.54E+05	-	79
NCT DREAM	Ridin'	3	-1.02E+05	-	4
OH MY GIRL	Dolphin	49	-8.87E+04	**	13
OH MY GIRL	Nonstop	50	-6.32E+04	***	6
Red Velvet	Monster	13	-6.85E+04	***	6
Red Velvet	Psycho	34	-1.04E+05	***	118
SEVENTEEN	Left & Right	11	-6.36E+03	-	6
SEVENTEEN	My My	3	4.11E+04	-	6
SEVENTEEN	VERY NICE	4	-9.16E+03	-	1455
SHINee	Don't Call Me	7	1.46E+05	-	6
TWICE	I CAN'T STOP ME	24	1.38E+05	***	6
TWICE	MORE & MORE	22	-2.69E+05	-	6
WINNER	Hold	3	-3.62E+04	-	24

Table 10 Sample sizes of regression results: Melon chart ranking predicting overall YouTube views (by song)

Sample Size	Total Results (61, 100%)		Sig. Results (21, 34%)		Non-Sig. Results (40, 66%)	
N < 8	17	28%	1	5%	16	40%
8 ≤ N < 25	24	39%	12	57%	12	30%
N ≥ 25	20	33%	8	38%	12	30%

Out of the total of 61 songs, sample sizes vary from N < 8 (17 songs, 28%), 8 ≤ N < 25 (24 songs, 39%), and N ≥ 25 (20 songs, 33%). Regression results showed that significance of Melon ranking predicting overall YouTube views is present in 21 out of 61 songs (34%) with sample sizes N ≥ 8 for 95% of the songs. 86% of significant results showed b_1 in negative numbers representing the opposite direction of Melon ranking and YouTube views as it should be if there is prediction. 14 out of 21 songs (67%) took less than two weeks to enter Melon chart after its release, while the remaining 7 out of 21 songs (33%) were released 8-22 weeks before charting during the test period. Nonetheless, all artists of these songs had new releases during this period. On the other hand, 40 out of 61 songs (66%) showed no significance with sample sizes N ≥ 8 for 60% of the songs. Almost half (19 songs) was released more than three weeks before chart entry during the test period.

Interestingly, several songs that have been released for a year and as long as more than four years still ranked within top 100 on Melon chart, however, they

showed no significance in predicting YouTube views. Three songs are from BTS and SEVENTEEN who have been on high ranks on the Brand Reputation Ranking every month during the test period, representing their consistent popularity in South Korea. Another song is from Brave Girls whose song “Rollin’” charted on Melon in March 2021, making their group name appear on the Brand Reputation Ranking from then on. Despite being a four-year-old song in which its promotion on music programs, radio shows, and other media has already been stopped, “Rollin’” suddenly topped many Korean music charts. This is a case of the “reverse-charting” phenomenon.

Figure 8 YouTube views and brand reputation rank of artists with normal charting and reverse-charting, October 2020 – April 2021

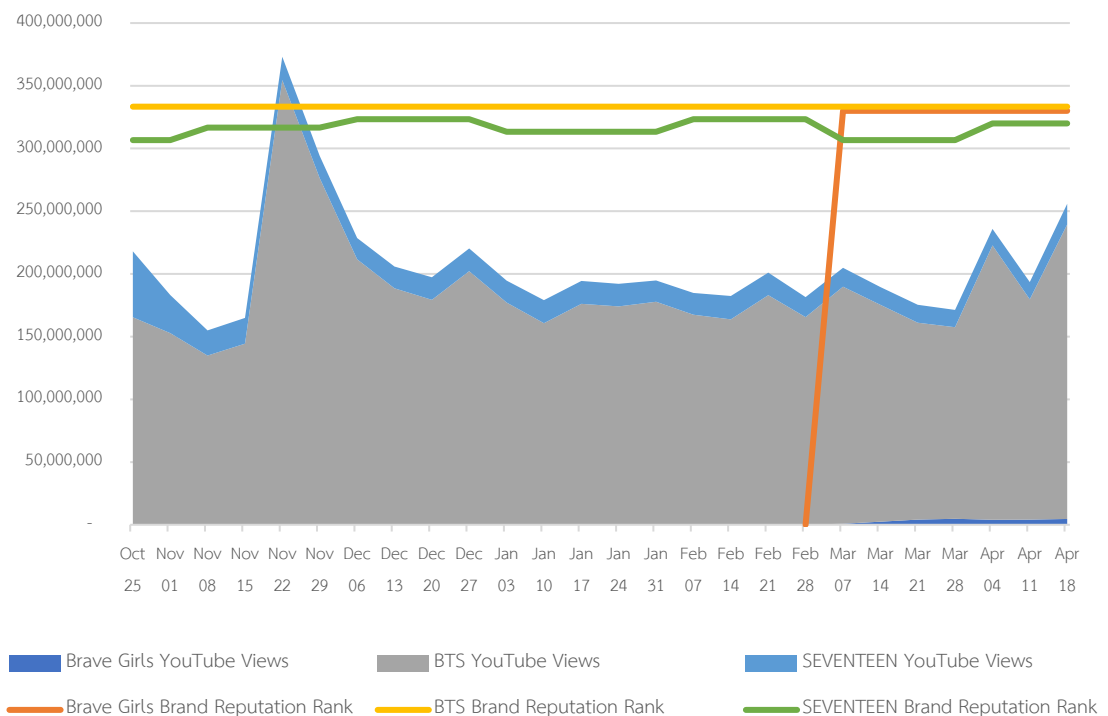


Figure 8 shows a 26-week data from a latter half of the test period. BTS and SEVENTEEN's YouTube views have been considerably high with the average of 187 million and 19 million views per week respectively. BTS ranked first on the Brand Reputation Ranking consecutively while SEVENTEEN's rank fluctuated between fourth and ninth. Brave Girls who has never appeared on the Brand Reputation Ranking since the beginning of the test period (April 2020) ranked second in March 2021 after the reverse-charting of "Rollin'" on major music platforms in South Korea. It was claimed to be a result of their fans' word-of-mouth which later spread around online social networks (Park, 2021). Brave Girls' weekly YouTube views averaged at 41 thousand before jumping to 217 thousand, 827 thousand, and an average of 4 million views per week after "Rollin'" topped Korean music charts since the end of February 2021. Although Brave Girls' reverse-charting mostly influenced on their reputation in South Korea and the test result showed no significance of Melon chart ranking predicting overall YouTube views, it was another phenomenon of a four-year-old song that gave the artist a huge opportunity in the music scene after 10 years of their career.

It is certain that Melon artists have large number of Korean listeners as their songs entered the chart, however, that did not seem to determine YouTube views for some artists. Table 11 shows the amount of one-year global YouTube views and South Korea YouTube views for 22 Melon artists, 20 tested and 2 untested in regressions. South Korea ranks third in average as a country that watches their

YouTube videos the most, emphasizing the popularity of these K-pop artists in their home country. Even though South Korea accounts for a small share compared to global views of some artists, viewers in South Korea might have contributed to the view increase relatively to the popularity indicated by Melon chart ranking. Being on Melon chart and having high South Korea YouTube views show that South Korea is a major listening country of artists with significant results.

Table 11 Global and South Korea YouTube views of 22 Melon artists (sorted by South Korea YouTube views)

Artist	1-Year Global Views (million)	South Korea		
		1-Year Views (million)	Country Rank	Share
BTS	13000	707.0	8	5.44%
BLACKPINK	11000	423.0	10	3.85%
TWICE	3240	209.0	4	6.45%
OH MY GIRL	324	161.0	1	49.69%
IZ*ONE	558	156.0	1	27.96%
SEVENTEEN	983	156.0	2	15.87%
Red Velvet	1030	149.0	1	14.47%
(G)I-DLE	797	140.0	1	17.57%
ITZY	1200	117.0	2	9.75%
MAMAMOO	1120	116.0	1	10.36%
GFRIEND	388	91.7	1	23.63%
EXO	935	67.9	3	7.26%
Apink	212	65.5	1	30.90%
NCT 127	616	62.4	3	10.13%
Brave Girls	86.4	60.8	1	70.37%
SHINee	279	53.4	1	19.14%
APRIL	83.6	52.7	1	63.04%

Artist	1-Year Global Views (million)	South Korea		
		1-Year Views (million)	Country Rank	Share
TXT	601	51.2	4	8.52%
NCT DREAM	407	45.6	3	11.20%
NCT U	688	43.3	3	6.29%
WINNER	192	43.3	1	22.55%
aespa	346	37.8	2	10.92%
Average	1731	136.8	3	20.24%

21 songs with significant results of Melon rank predicting YouTube views are released by 10 artists: (G)I-DLE, Apink, BLACKPINK, BTS, ITZY, IZ*ONE, MAMAMOO, OH MY GIRL, Red Velvet, and TWICE as highlighted in table 11. 90% of them had over 100 million YouTube views from South Korea in a year. 70% also gained YouTube views in South Korea above the Melon artists' average of 136.8 million. Among all Melon artists, South Korea ranks third in average, emphasizing the popularity in their home country. As much as 70% of Melon artists also has South Korea as the first and second viewing country on YouTube.

4.1.2 Results by artist

Regressions are run on 19 artists, all songs combined for each. Number of artists is different from that in 4.1.1 as it is reduced from 20 groups after aggregating two sub-units who are managed under the same group and sometimes have

overlapping members for song promotions. Results are as shown in table 12 with sample sizes in table 13.

Table 12 Results: Melon chart ranking predicting overall YouTube views (by artist)

Artist	N (weeks)	b_1	Sig.	Artist	N (weeks)	b_1	Sig.
(G)I-DLE	36	-7.64E+04	***	IZ*ONE	58	-3.70E+04	-
aespa	14	1.16E+05	-	MAMAMOO	64	-7.57E+03	-
Apink	27	1.28E+05	-	NCT ⁴	10	1.27E+05	-
APRIL	4	1.99E+04	-	OH MY GIRL	99	-6.16E+04	***
BLACKPINK	102	-3.55E+04	-	Red Velvet	47	-8.92E+04	***
Brave Girls	10	6.07E+03	-	SEVENTEEN	18	2.83E+04	-
BTS	512	-4.09E+04	-	SHINee	7	3.85E+05	-
EXO	13	-5.51E+04	-	TWICE	46	-2.15E+04	-
GFRIEND	4	8.33E+05	-	WINNER	5	-2.67E+04	-
ITZY	41	-2.20E+04	-				

Table 13 Sample sizes of regression results: Melon chart ranking predicting overall YouTube views (by artist)

Sample Size	Total Results (19, 100%)		Sig. Results (3, 16%)		Non-Sig. Results (16, 84%)	
N < 8	4	21%	0	0%	4	25%
8 ≤ N < 25	5	26%	0	0%	5	31%
N ≥ 25	10	53%	3	100%	7	44%

Sample sizes of 19 artists are N < 8 (4 songs, 21%), 8 ≤ N < 25 (5 songs, 26%), and N ≥ 25 (10 songs, 53%). Some artists' YouTube views were found to be predicted

⁴ Aggregated songs by NCT 127 and NCT DREAM as they are sub-units of the group NCT

by Melon chart ranking when tested by song, however, prediction is mostly absence when tested by artist despite having larger sample sizes. Significance showed only on three artists: (G)I-DLE, OH MY GIRL, and Red Velvet, which are female groups who had fair to high share of South Korea YouTube views at 17.57%, 49.69%, and 14.47%. The amount of South Korea YouTube views of these three groups are in upper ranks among 19 Melon artists as highlighted in table 14. All significant results showed b_1 in negative numbers representing the opposite direction of Melon ranking and YouTube views as it should be if there is prediction.

Table 14 Global and South Korea YouTube views of 19 Melon artists (sorted by South Korea YouTube views)

Artist	1-Year Global Views (million)	South Korea		
		1-Year Views (million)	Country Rank	Share
BTS	13000	707.0	8	5.44%
BLACKPINK	11000	423.0	10	3.85%
TWICE	3240	209.0	4	6.45%
OH MY GIRL	324	161.0	1	49.69%
IZ*ONE	558	156.0	1	27.96%
SEVENTEEN	983	156.0	2	15.87%
Red Velvet	1030	149.0	1	14.47%
(G)I-DLE	797	140.0	1	17.57%
ITZY	1200	117.0	2	9.75%
MAMAMOO	1120	116.0	1	10.36%
NCT ⁵	1023	108.0	3	10.56%
GFRIEND	388	91.7	1	23.63%

⁵ Aggregated data of NCT 127 and NCT DREAM as they are sub-units of the group NCT

Artist	1-Year Global Views (million)	South Korea		
		1-Year Views (million)	Country Rank	Share
EXO	935	67.9	3	7.26%
Apink	212	65.5	1	30.90%
Brave Girls	86.4	60.8	1	70.37%
SHINee	279	53.4	1	19.14%
APRIL	83.6	52.7	1	63.04%
WINNER	192	43.3	1	22.55%
aespa	346	37.8	2	10.92%

4.1.3 Results by label

Regressions are run on four major labels⁶, HYBE Labels (former Big Hit Entertainment), JYP Entertainment, SM Entertainment, YG Entertainment, and nine minor labels combined as others to observe whether the label name affects its artists' YouTube views.

Table 15 Results: Melon chart ranking predicting overall YouTube views (by label)

Label	N (weeks)	b_1	Sig.
HYBE	512	-4.09E+04	-
JYP	87	-8.29E+04	-
SM	91	-7.10E+04	***
YG	107	-5.05E+05	*
Others	320	6.75E+04	***

⁶ Considering company's market capitalization according to the Korea Composite Stock Price Index (KOSPI)

Table 16 Global and South Korea YouTube views by label

Label	1-Year Global Views (million)	South Korea	
		1-Year Views (million)	Share
HYBE	13000	707.0	5.44%
JYP	4440	326.0	7.34%
SM	3613	416.1	11.52%
YG	11192	466.3	4.17%
Others	4552	999.7	21.96%

With all labels having sample sizes $N \geq 25$, SM Entertainment, YG Entertainment, and other minor labels showed significance of the prediction as shown in table 15. Two-thirds of significant results showed b_1 in negative numbers representing the opposite direction of Melon ranking and YouTube views as it should be if there is prediction. On the other hand, HYBE Labels and JYP Entertainment showed no significance of Melon chart ranking predicting YouTube views of its artists while YG Entertainment also had merely little significance level. Similarly, these three labels have less than 7.5% share of South Korea YouTube views while those of SM Entertainment and other minor labels are 11.52% and 21.96% respectively as shown in table 16.

4.2 Melon chart ranking predicting YouTube Music chart ranking

To see the prediction of ranking on the major platform on a minor one, simple regression is run on songs by Melon artists that enter both Melon chart and

South Korea YTM chart by the equation $[YTM_t = b_0 + b_2 \text{Melon}_{t-1} + e]$. b_2 should be positive numbers if there is prediction as the rank moves in the same direction on both platforms. Number of songs decreased from 61 to 40 as those with no entry on YTM chart could not be tested. Sample sizes of some songs also decreased when there was an entry on Melon chart but none on YTM chart in a particular week or more, making it impossible to run regressions on songs with inadequate sample sizes. Results are shown in table 17 with sample sizes in table 18.

Table 17 Results: Melon chart ranking predicting YouTube Music chart ranking

Artist	Song Title	N (weeks)	b_2	Sig.	Days Released
(G)-DLE	HWAA	11	6.01E-01	***	6
(G)-DLE	DUMDi DUMDi	19	5.83E-01	***	6
(G)-DLE	Oh my god	5	5.45E-01	**	13
aespa	Black Mamba	14	-9.54E-02	-	12
Apink	Dumhdurum	19	9.35E-01	***	6
APRIL	LALALILALA	4	5.25E-01	**	11
BLACKPINK	Ice Cream (with Selena Gomez)	15	1.17E+00	***	2
BLACKPINK	Lovesick Girls	28	4.57E-01	***	2
BLACKPINK	How You Like That	42	5.31E-01	***	2
BLACKPINK	Pretty Savage	10	3.24E-01	*	9
BLACKPINK	Bet You Wanna (Feat. Cardi B)	5	5.01E-01	***	9
Brave Girls	We Ride	4	3.33E-01	-	219
Brave Girls	Rollin'	6	2.04E-02	-	1461
BTS	Fly To My Room	4	-1.15E-01	-	2
BTS	Dynamite	34	1.39E+00	-	2
BTS	Friends	4	1.20E-01	-	58
BTS	Black Swan	10	-6.06E-01	-	58
BTS	Life Goes On	20	-2.33E+00	***	2
BTS	Savage Love (Laxed - Siren Beat)	20	8.72E-01	*	9
BTS	(BTS Remix)				
BTS	Blue & Grey	5	3.89E-01	***	9

Artist	Song Title	N (weeks)	b_2	Sig.	Days Released
BTS	ON	43	1.35E+00	***	58
GFRIEND	Apple	3	2.13E+00	-	6
ITZY	Not Shy	16	7.74E-01	***	6
ITZY	WANNABE	25	2.39E-01	***	41
IZ*ONE	Secret Story of the Swan	14	5.82E-01	***	6
IZ*ONE	Panorama	18	2.93E-01	***	6
IZ*ONE	FIESTA	26	3.69E-01	***	62
MAMAMOO	AYA	6	6.72E-01	-	5
MAMAMOO	Dingga	19	9.71E-01	***	5
MAMAMOO	HIP	20	4.37E-01	***	157
NCT 127	Kick It	3	2.60E+00	-	79
NCT DREAM	Ridin'	4	5.12E-01	-	4
OH MY GIRL	Nonstop	50	-3.28E-01	***	6
OH MY GIRL	Dolphin	23	3.89E-01	*	13
Red Velvet	Monster	13	7.29E-01	***	6
Red Velvet	Psycho	33	4.45E-01	***	118
SEVENTEEN	Left & Right	11	8.78E-01	***	6
SHINee	Don't Call Me	7	4.30E-01	**	6
TWICE	MORE & MORE	21	3.45E-01	***	6
TWICE	I CAN'T STOP ME	24	4.80E-01	***	6

Table 18 Sample sizes of regression results: Melon chart ranking predicting YouTube Music chart ranking

Sample Size	Total Results (40, 100%)		Sig. Results (29, 72.5%)		Non-Sig. Results (11, 27.5%)	
	N < 8	13	33%	5	17%	8
8 ≤ N < 25	19	48%	17	59%	2	18%
N ≥ 25	8	20%	7	24%	1	9%

Out of 40 songs by 18 artists, sample sizes vary from N < 8 (13 songs, 33%), 8 ≤ N < 25 (19 songs, 48%), and N ≥ 25 (8 songs, 20%). Significance is present in 29 out of 40 songs (72.5%). 93% of significant results showed b_2 in positive numbers

representing the same direction of Melon ranking and YTM ranking as it should be if there is prediction. 83% (24 out of 29 songs) are new releases as the time taken before charting is less than two weeks. Only 17% (5 out of 29 songs) were released 6-22 weeks prior to Melon chart entry, however, it is similar to regressions for Melon chart ranking predicting overall YouTube views in 4.1 that all artists had new releases during the test period. Considering the informative sample size $N = 8$, the proportion of songs tested with $N \geq 8$ sample sizes for significant and non-significant results are 83% and 27% respectively.

4.3 Overall YouTube views predicting Melon chart ranking

Besides looking for prediction of Melon chart ranking on overall YouTube views, simple regressions are run reversely to see if a global platform predicts the domestic one by the equation [$Melon_t = b_0 + b_3 YouTube_{t-1} + e$]. b_3 should be negative numbers if there is prediction as the higher the views (large number), the higher the rank goes up (small number).

Number of songs tested is not equal to that in 4.1.1 due to insufficient sample sizes. After testing 55 songs by 16 artists, results are shown in table 19 with sample sizes in table 20.

Table 19 Results: overall YouTube views predicting Melon chart ranking (by song)

Artist	Song Title	N (week)	b_3	Sig.	Days Released
(G)I-DLE	DUMDi DUMDi	20	-6.61E-07	-	6
(G)I-DLE	HWAA	11	-7.27E-07	-	6
(G)I-DLE	Oh my god	3	-6.50E-06	-	13
aespa	Black Mamba	14	7.77E-09	-	12
Apink	Dumhdurum	25	-6.78E-06	***	6
BLACKPINK	Bet You Wanna (Feat. Cardi B)	5	-2.09E-07	**	9
BLACKPINK	How You Like That	42	-1.17E-07	***	2
BLACKPINK	Ice Cream (with Selena Gomez)	15	-1.65E-07	**	2
BLACKPINK	Lovesick Girls	30	-2.82E-08	-	2
BLACKPINK	Pretty Savage	11	-2.82E-08	-	9
Brave Girls	Rollin'	8	-2.00E-08	-	1461
Brave Girls	We Ride	6	-3.62E-05	**	219
BTS	00:00 (Zero O'Clock)	27	-2.78E-07	-	58
BTS	Black Swan	25	-1.75E-07	-	58
BTS	Blue & Grey	10	-3.52E-07	***	9
BTS	Boy With Luv (Feat. Halsey)	52	6.56E-09	-	373
BTS	Dis-ease	3	-2.21E-07	-	9
BTS	Dynamite	36	-7.59E-09	-	2
BTS	Filter	23	-1.57E-07	-	58
BTS	Fly To My Room	9	-3.68E-07	***	2
BTS	Friends	25	-1.79E-07	-	58
BTS	Inner Child	12	2.77E-07	-	58
BTS	Interlude : Shadow	11	1.94E-07	*	58
BTS	Life Goes On	23	-7.49E-08	-	2
BTS	Louder than bombs	11	2.25E-07	*	58
BTS	Moon	25	-1.93E-07	-	58
BTS	My Time	17	-2.34E-08	-	58
BTS	ON	45	3.30E-08	-	58
BTS	Outro : Ego	11	1.46E-07	-	58
BTS	Respect	9	2.07E-07	-	58
BTS	Savage Love (Laxed - Siren Beat) (BTS Remix)	29	6.97E-09	-	9
BTS	Spring Day	52	-1.05E-08	-	1161
BTS	Stay	3	-2.34E-07	-	9
BTS	Telepathy	3	-2.01E-07	-	9
BTS	UGH!	11	2.18E-07	**	58
BTS	We are Bulletproof : the Eternal	18	-1.08E-07	-	58

Artist	Song Title	N (week)	b_3	Sig.	Days Released
EXO	1 Billion Views	4	-9.49E-07	*	6
EXO	Obsession	7	-1.59E-06	-	144
GRIEND	Apple	3	1.97E-07	-	6
ITZY	Not Shy	16	-9.97E-07	***	6
ITZY	WANNABE	23	4.89E-07	-	41
IZ*ONE	FIESTA	24	-6.58E-07	-	62
IZ*ONE	Panorama	19	5.52E-08	-	6
IZ*ONE	Secret Story of the Swan	14	-1.56E-06	*	6
MAMAMOO	AYA	7	-1.01E-06	*	5
MAMAMOO	Dingga	26	-1.92E-06	***	5
MAMAMOO	HIP	30	5.20E-07	-	157
OH MY GIRL	Dolphin	50	-1.63E-06	***	13
OH MY GIRL	Nonstop	48	-4.09E-06	***	6
Red Velvet	Monster	13	-5.33E-06	***	6
Red Velvet	Psycho	32	-3.82E-06	***	118
SEVENTEEN	Left & Right	9	3.14E-06	-	6
SHINee	Don't Call Me	9	-4.50E-07	-	6
TWICE	I CAN'T STOP ME	25	-6.97E-07	***	6
TWICE	MORE & MORE	20	-1.46E-06	***	6

Table 20 Sample sizes of regression results: overall YouTube views predicting Melon ranking (by song)

Sample Size	Total Results (55, 100%)		Sig. Results (21, 38%)		Non-Sig. Results (34, 62%)	
$N < 8$	11	20%	4	19%	6	18%
$8 \leq N < 25$	26	47%	10	48%	17	50%
$N \geq 25$	18	33%	7	33%	11	32%

Regression results showed that significance of overall YouTube views predicting Melon ranking is present in 21 out of 55 songs (38%) by 11 artists: Apink, BLACKPINK, Brave Girls, BTS, EXO, ITZY, IZ*ONE, MAMAMOO, OH MY GIRL, Red Velvet,

and TWICE. 86% of significant results showed b_3 in negative numbers representing the opposite direction of YouTube views and Melon ranking as it should be if there is prediction. 16 out of 21 songs (76%) took up to two weeks to enter Melon chart after its release, and 5 out of 21 songs (24%) were released 8-31 weeks before charting during the test period. The proportion of new releases and previous releases are similar with 4.1.1.

15 out of 21 songs (71%) showed significance of prediction in a two-way direction between Melon chart ranking and overall YouTube views. 6 out of 21 songs (29%) showed significance only in a one-way direction which is overall YouTube views predicting Melon chart ranking. Melon and YouTube data of these 6 songs are shown in table 21.

Table 21 Melon and YouTube data of songs with one-way significance

Melon					YouTube			
					Global	South Korea		
Artist	Song Title	N (weeks)	Sig.	Days Released	1-Year Views (million)	1-Year Views (million)	Country Rank	Share
Brave Girls	We Ride	6	**	219	86.4	60.8	1	70.37%
BTS	Fly To My Room	9	***	2	13000	707.0	8	5.44%
BTS	UGH!	11	**	58	13000	707.0	8	5.44%
EXO	1 Billion Views	4	*	6	935	67.9	3	7.26%
MAMAMOO	AYA	7	*	5	1120	116.0	1	10.36%
TWICE	MORE & MORE	20	***	6	3240	209.0	4	6.45%

A common point could be seen in four groups with one-way significance of overall YouTube views predicting Melon chart ranking: BTS, EXO, MAMAMOO, and TWICE. These artists have a small share of South Korea YouTube views accounting for less than 11% of global views, which means over 89% of the views come from outside of South Korea. The amount of their global popularity could be large enough that it can predict the ranking of some songs on the largest domestic music chart. Brave Girls is the group with an opposite characteristic despite showing the same result of one-way significance. As high as 70% of Brave Girls' YouTube views is from South Korea which it suggests that their songs should have shown significance of Melon chart ranking predicting overall YouTube views, yet it did not. Nevertheless, Brave Girls' "We Ride" which was released 31 weeks prior to chart entry showed the significance in overall YouTube views predicting Melon chart ranking. This could be the result of the reverse-charting of "Rollin'" mentioned in 4.1.1 that increased their popularity on YouTube, thus affecting another song to rank on Melon chart. Meanwhile, 34 out of 55 songs (62%) showed no significance. Considering the informative sample size $N = 8$, the proportion of songs tested with $N \geq 8$ sample sizes for significant and non-significant results are 81% and 82% respectively.

CHAPTER V

CONCLUSION AND RECOMMENDATIONS

This study is approached by quantitative method to examine whether chart ranking of songs on the dominating music streaming platform “Melon” in South Korea is a leading indicator for K-pop music industry. Granger causality was tested to find a prediction of song ranking on Melon chart (domestic performance) on artists overall YouTube views (global performance). Moreover, it aims to find what artists or entertainment companies could utilize to evaluate or develop their domestic and global performance. Regression analysis was conducted by using the data of 61 songs by 20 artists in various categorization.

5.1 Conclusion

By regression results, it could be concluded that there is no Granger causality in Melon chart ranking predicting overall YouTube views as overall YouTube views also showed significance in predicting Melon chart ranking. Two-way prediction was present in most songs which means Melon chart ranking of a song and artist’s overall YouTube views move along together in terms of popularity. Thus, neither Melon chart ranking nor overall YouTube views predict one another during the period of this study.

Regression results and artists' YouTube statistics during the test period showed that significance of prediction in both ways was present in artists who have considerably high global YouTube views and a large proportion of South Korea YouTube views. Despite having few significant results, regression results by artist showed common characteristics of three groups whose songs' ranking on Melon chart predicted overall YouTube views which are having a large share of South Korea YouTube views and being female groups. A study by Im et al. (2018) found that songs by female groups survive on South Korean music charts longer than others, positively suggesting that female groups' songs are preferred on both Melon and YouTube in South Korea. It was also shown in regression results by label that Melon chart ranking did not predict overall YouTube views of artists under labels with small share of South Korea YouTube views. It was observable that most songs on Melon chart are new releases. Older releases by an artist also entered the chart when they released new songs in most cases. However, most of older releases' entry on Melon chart did not show significance in predicting artists' overall YouTube views while that of new releases mostly did. It could be seen that Melon chart entry of newly released songs are more likely to predict artists' overall YouTube views than older releases.

Melon chart ranking also predicted YTM chart ranking in most regression results, affirming how Melon is a leading music streaming platform in South Korea that predict chart rankings on another platform.

5.2 Discussion

On one hand, regression results in 4.1.1 showed that South Korea most likely is the driver of some Melon artists' YouTube views, such as (G)I-DLE, IZ*ONE, OH MY GIRL, and Apink, as it ranks first and has a large share among all countries. On the other hand, foreign countries tend to have more impact on YouTube views for BTS, BLACKPINK, TWICE, ITZY, MAMAMOO, and Red Velvet whose share of South Korea YouTube views account for less than 15%. Especially for BTS and BLACKPINK, South Korea ranks eighth and tenth which makes up to only 5.44% and 3.85% share respectively. Some Non-Melon artists also have the same characteristic of having a small share in South Korea with a large number of global views. The only difference is that their songs did not chart on Melon.

The size of global YouTube views correlates with ranking on Melon chart in a manner that most Melon artists have high YouTube views at the average of 1.7 billion during a one-year period. If BTS and BLACKPINK are excluded as they are groups with exceptionally high YouTube views, the average global YouTube views of Melon artists is 704 million which is more than a triple of non-Melon artists average of 208 million. When comparing Melon artists and non-Melon artists by groups with similar global YouTube views as shown in table 22, it can be observed that Melon artists have a bigger share of YouTube views in South Korea than non-Melon artists. Considering Non-Melon artists with highest global YouTube views on the list, Stray Kids, BIGBANG, TREASURE, and GOT7 have smaller proportion of South Korea

YouTube views than ITZY, (G)I-DLE, NCT U, and NCT 127 while their global YouTube views. Looking at Melon artists with lowest global YouTube views, Brave Girls and APRIL have at least about 3-7 times larger share of South Korea YouTube views than non-Melon artists with similar global YouTube views which are WJSN, NU'EST, AB6IX, and STAYC.

Table 22 Global YouTube views and South Korea share of Melon/non-Melon artists

Melon Artist	1-Year Global YouTube Views (million)	South Korea Share	Non-Melon Artist	1-Year Global YouTube Views (million)	South Korea Share
BTS	13000	5.44%	Stray Kids	1410	< 2.67%
BLACKPINK	11000	3.85%	BIGBANG	823	13.61%
TWICE	3240	6.45%	TREASURE	696	3.13%
ITZY	1200	9.75%	GOT7	636	< 1.97%
MAMAMOO	1120	10.36%	EVERGLOW	387	4.32%
Red Velvet	1030	14.47%	NCT	343	6.82%
SEVENTEEN	983	15.87%	MOMOLAND	339	11.30%
EXO	935	7.26%	MONSTA X	332	5.81%
(G)I-DLE	797	17.57%	Girls' Generation	302	16.66%
NCT U	688	6.29%	Super Junior	297	10.37%
NCT 127	616	10.13%	Dreamcatcher	247	8.62%
TXT	601	8.52%	ASTRO	233	8.33%
IZ*ONE	558	27.96%	LOONA	223	11.03%
NCT DREAM	407	11.20%	PENTAGON	198	8.28%
GFRIEND	388	23.63%	THE BOYZ	186	16.94%
aespa	346	10.92%	T-ARA	173	21.45%
OH MY GIRL	324	49.69%	CLC	147	6.55%
SHINee	279	19.14%	BTOB	135	28.00%
Apink	212	30.90%	AOA	121	28.93%
WINNER	192	22.55%	SF9	110	10.36%
Brave Girls	86	70.37%	ENHYPEN	104	< 2.63%
APRIL	84	63.04%	VICTON	95	8.34%
			fromis_9	91	36.36%
			WJSN	87	30.25%
			NU'EST	85	13.51%
			AB6IX	84	10.08%

Melon Artist	1-Year Global YouTube Views (million)	South Korea Share	Non-Melon Artist	1-Year Global YouTube Views (million)	South Korea Share
			STAYC	84	23.16%
			CRAVITY	82	6.48%
			2PM	81	29.59%
			Weeekly	73	5.59%
			TVXQ!	71	25.91%
			Wanna One	62	16.53%
			Girl's Day	59	34.01%
			ONF	57	26.57%
			Lovelyz	57	59.26%
			Weki Meki	51	17.67%
			INFINITE	45	31.86%
			BLOCK B	45	42.57%
			VIXX	37	32.52%
			B1A4	33	27.39%
			TEEN TOP	28	46.76%
Melon Artist Average			2AM	4	39.75%
- All	1731	20.24%	Non-Melon Artist		
- Excluding BTS and BLACKPINK	704	21.80%	Average	208	20.12%

It suggests once again that Melon is an indicator of the artist's popularity in South Korea. However, as K-pop music has become a global matter for many years, it is crucial for every entertainment label to optimize this opportunity. As regression results showed, Melon chart ranking did not predict overall YouTube views for some Melon artists especially those who have lower global YouTube views while it did for Melon artists with higher global YouTube views. This may be implied that artists who are not reaching to global consumers as much should put more focus on expanding to global markets. It is certain that doing well both in domestic and international markets are the best scenario a business can have, yet things cannot be predicted

especially in the music industry as hit songs also come with luck and timing just like in the reverse-charting phenomenon. Global strategies could be seen to have been implemented by many companies, especially major labels, such as using English to communicate with potential consumers on social network platforms, providing multi-language subtitles on their own YouTube videos, or launching offline and online advertisements outside South Korea. Even though global strategies might include partnering up with international distributors for physical sales or holding events overseas, being able to reach the fans or the potential consumers by communication might bring a larger impact as technology and the internet have also been contributing so much to K-pop especially YouTube.

Apart from all regressions which focuses only on songs and artists that need to appear on Melon chart, another point that could be observed from YTM chart is that YTM may be more popular among K-pop listeners as there are more songs by more various Brand Reputation artists. Ranking on YTM chart also shows more fluctuation as particular songs have a frequent re-entry, unlike on Melon chart where a song's ranking generally falls by time until dropping out of the chart. When looking at statistics in a specific period alone, it is positive to see that Melon artists are more popular than Non-Melon or YTM artists in South Korea as Melon is the most used music streaming platform domestically. However, there are possible circumstances where the artist may not be active by releasing songs under the group name but by its members' solo or unit activities whether in music or other entertainment fields

such as dramas, musicals, or TV shows, thus there is no song by the group on Melon chart but the group's name is amidst the public attention as can be indicated by the Brand Reputation Ranking. Examples could be observed from table 23 showing the frequency of appearing on the Brand Reputation Ranking and the average rank of each Melon-YTM artist and YTM artist.

Table 23 Average entry frequency and rank of artists on brand reputation ranking

	Melon-YTM Artist	Top 50 Entry Frequency ⁷	Average Rank	YTM Artist	Top 50 Entry Frequency	Average Rank
HYBE Labels	BTS	13	1			
	TXT	10	25			
JYP Entertainment	ITZY	12	21	2PM	8	38
	TWICE	13	6	GOT7	5	41
				Stray Kids	9	33
SM Entertainment	aespa	4	19	Girls' Generation	11	18
	EXO	13	8	Super Junior	11	24
	NCT ⁸	13	8	TVXQ!	9	40
	Red Velvet	13	12			
	SHINee	11	21			
YG Entertainment	BLACKPINK	13	3	TREASURE	3	19
	WINNER	11	29			
Others	(G)I-DLE	13	7	AB6IX	8	31
	Apink	12	25	AOA	4	38
	APRIL	11	20	ASTRO	11	24
	Brave Girls	2	2	B1A4	2	25
	GFRIEND	13	14	BTOB	10	31
	IZ*ONE	13	7	CLC	4	37
	MAMAMOO	13	11	CRAVITY	4	39
	OH MY GIRL	13	8	Dreamcatcher	10	38
	SEVENTEEN	13	8	ENHYPEN	2	39
				EVERGLOW	2	32
				fromis_9	5	32

⁷ Based on 13-month Brand Reputation Ranking data (April 2020 – April 2021)

⁸ Includes NCT, NCT 127, NCT DREAM, and NCT U

	Melon-YTM Artist	Top 50 Entry Frequency ⁷	Average Rank	YTM Artist	Top 50 Entry Frequency	Average Rank
				Girl's Day	1	49
				LOONA	11	27
				Lovelyz	11	23
				MOMOLAND	7	36
				MONSTA X	11	25
				NU'EST	10	27
				ONF	7	24
				PENTAGON	7	36
				SF9	8	42
				STAYC	2	25
				T-ARA	4	27
				TEEN TOP	2	25
				THE BOYZ	11	26
				VICTON	7	45
				Weeekly	7	23
				Weki Meki	9	37
				WJSN	11	23
Average	Melon-YTM Artist	11	13	YTM Artist	7	31

On average, Melon-YTM artists appeared on the Brand Reputation Ranking 11 out of 13 times (88%) at the 13th rank, which is more frequent and highly ranked than YTM artists who appeared 7 out of 13 times (54%) at the 31st rank. It could be observed that despite being under major labels, some artists' songs were able to enter Melon chart and some were not. In contrast, many artists from minor labels ranked on Melon chart and even stayed for months, corresponding to a study by Im et al. (2018) in which results showed that distribution by a major company has no effect on the survival time of songs on the streaming chart, and that songs distributed by minor labels have the potential to succeed on streaming charts.

5.3 Limitations and further studies

This study used a one-year time series data of Melon chart ranking, YTM chart ranking, and YouTube views for the analysis. Longer period of data would have made regression results more solid as the greater the number of observations, the more reliable statistical outputs could be. Nevertheless, it was limited by artists' daily YouTube views provided on YTM charts and insights which could be tracked up to maximum of 12 months. Another limitation to sample sizes was a small variety of K-pop songs and artists on Melon chart as it is the most used music platform with various genres being streamed. Therefore, accuracy of regression results could be limited because of small sample sizes.

Some Brand Reputation artists were excluded from the analysis as their YouTube statistics were unavailable. Although YouTube provides artists' statistics, not all K-pop artists show up when searched manually. For artists with no search results, their data can be accessed only if their songs entered YTM chart as artist names shown on the chart are linked to their statistics page. Overall analysis could have been covered more thoroughly if there was no constraint in unavailability of some artists' YouTube data. Another limitation was YouTube views by country which were the share of top countries as of one year (12 months as provided by YouTube). When analyzing regression results of a song that entered Melon chart shorter than a year, the share of South Korea YouTube views of that specific period may differ from

the one-year share. Thus, the analysis could have been more accurate if YouTube data could be viewed in selected period.

Regressions were also attempted to test whether Melon chart ranking predicts overall YouTube views through the mediation of South Korea YTM chart ranking. However, South Korea YTM chart ranking does not mediate between Melon chart ranking and overall YouTube views despite being the platform related to YouTube itself. As South Korea YTM has MAUs approximately four times less than those of Melon, it is reasonable that South Korea YTM chart ranking does not act as a mediator and influence artists' overall YouTube views.

Findings of this study could be the ground for further studies of different music platforms or different music genres with more variables concerned. As this study only analyzes YouTube data along with regression results, other factors such as acoustic features of the song, composers, or seasonal features could also be considered. This kind of research may be beneficial to South Korean musicians, not only K-pop artists but also those in different genres, in a way to find out which market should be their focus or what strategy does not contribute to their success. As mentioned about music chart manipulation in South Korea, it shows the possibility of some artists who urge to perform well on domestic charts. Suppose there is a further study on any other genres, it might turn out that expanding to the global market yields more effective result than concentrating only on domestic popularity.

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