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THE IMPACT OF YOUTUBE ON INTERNATIONAL TRADE

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Abstract

Many researchers in the field of international business have argued that cultural proximity can positively influence bilateral trade. These researchers have attempted to develop proxy measures for cultural proximity, such as language, ethnicity, religion, and trade of cultural goods. However, the conventional measures failed to capture the time-variant characteristics of cultural affinity or digitization in international trade. As an alternative approach, in this study, we focused on cultural affinity in social media like YouTube. Based on the recent popularity of Korean pop (K-pop) on YouTube, we hypothesized that online consumption of K-pop content creates an affinity for Korea as a country, resulting in higher Korean exports. We used panel data analysis for YouTube comments on K-pop music videos that were published from the second quarter of 2009 to the third quarter of 2012; these comments were segregated on the basis of the users' home countries. We found that the YouTube comments of each country in the current and previous quarters are significant predictors of Korea's total exports and exports of consumer goods such as processed food, clothes, and cosmetics to that particular country.

Keywords: Social media, YouTube, K-pop, cultural proximity, international trade

1 INTRODUCTION

YouTube is a video-sharing website established in February 2005. The website enables individuals to watch and share user-generated videos. Furthermore, the website also serves as an online content distribution channel for creators and advertisers. Although individual users generate most of the content on YouTube, media corporations such as news agencies, TV channels, film studios, and other entertainment companies have realized YouTube's potential in attracting customers and boosting the sales of their products and services.

Similar to other countries, South Korea's entertainment industry has also realized YouTube's potential. In particular, Korean pop (K-pop) record labels such as SM Entertainment, YG Entertainment, and JYP Entertainment have created dedicated channels on YouTube to promote their artists and music by uploading music videos on the website. Users can watch music videos and share them with their families and friends. Thus, YouTube has emerged as the most effective and successful marketing tool for K-pop entertainment agencies.

Several years ago, K-pop was popular only in Asian countries. However, owing to the rapid spread of social media (like YouTube and Twitter), K-pop has gained global recognition and its fandom has spread beyond Asia to the US and Europe (Oliver, 2012; Yoon, 2010). In December 2011, to meet the growing demand of worldwide consumers, YouTube added the K-pop genre to its music page alongside R&B, Rock, Pop, and Rap. This was the first time that a specific country's music was introduced as a separate genre (Lee, 2011).

Based on data acquired from YouTube, JoongAng Daily reported that as of 2012, K-pop music videos on YouTube had attracted 2.9 billion views from Asia, followed by 1.1 billion views from the US and 0.7 billion views from Europe (Song, 2012). The worldwide success of K-pop has not only enabled Korea to improve its overall image as a country but also positively affected the Korean economy. The Korea Customs Service reported that the K-pop culture (including drama and music) has helped to increase the nation's exports (including consumer goods) and to attract more foreign tourists (Korea Customs Service, 2011).

Many international business researchers have argued that cultural proximity among countries plays an important role in facilitating international trade. Cultural proximity can be defined as "the sharing of a common identity, to the feeling of belonging to the same group, and to the degree of affinity between two countries" (Felbermayr & Toubal, 2010, p. 279). Researchers have argued that cultural proximity can reduce trade costs and, thereby, boost bilateral trade (Disdier et al., 2010; Garnaut, 1994).

To estimate the impact of cultural proximity, researchers have attempted to develop various proxy measures for cultural proximity such as language, religion, and ethnicity. However, the conventional proxy measures have limitations. First, most of the proxy measures are time-invariant. For example, common language and religious proximity cannot catch up with the broad and time-variant nature of cultural affinity. To complement the weakness of traditional time-invariant proxies, some researchers adopted trade of cultural goods as an alternative measure to track the changes in cultural preferences over time (Disdier et al., 2010; Kim & Ahn, 2012). However, with the advent of e-commerce, cultural goods (e.g., recorded media) has been digitized to enable it to be traded online, and thus, trade of cultural goods cannot measure cultural proximity.

In light of the increasing digitization in the Internet era, we generated a new online proxy measure for cultural proximity. We focused on the recent popularity of K-pop on social media such as YouTube and hypothesized that online consumption of K-pop content creates an affinity for Korea and Korean goods among users, which leads to higher exports from Korea to the users' home countries. In this study, based on the data available on K-pop and Korea's exports, we developed a new proxy measure for cultural proximity and examined whether this measure captures international trade flow.

2   LITERATURE REVIEW

Many researchers in the field of international business have examined the determinants of and the factors that influence bilateral trade. Thus, the impact of bilateral cultural proximity on international trade has emerged as a topic of discussion in this area (Disdier et al., 2010). It has been argued that cultural affinity can positively influence bilateral trade by reducing transaction/information costs (Disdier et al., 2010; Garnaut, 1994).

To empirically estimate the impact of cultural proximity on trade, researchers have attempted to develop various proxy measures for cultural proximity, such as language (Fidrmuc & Fidrmuc, 2009; Melitz, 2008), religion (Guo, 2004), business network (Combes et al., 2005; Rauch, 2001), ethnicity (Girma & Yu, 2002; Head & Ries, 1998; Rauch & Trindade, 2002), past colonial links (Eichengreen & Irwin, 1998), and the composite index under Hofstede's classification of culture (Hofstede, 1994; Kogut & Singh, 1988).

However, some researchers highlighted that the conventional measures mentioned above had a few limitations because they could not fully capture the comprehensive notion of cultural affinity (owing to limited samples and the time-invariant characteristic of the measures) (Disdier et al., 2010; Felbermayr & Toubal, 2010). In an alternative approach, based on UNESCO's classification of cultural goods (UNESCO, 2005), some researchers developed trade of cultural products, including books, recorded media, and audio-visual media, as a proxy measure for cultural proximity (Disdier et al., 2010; Kim & Ahn, 2012; Park & Choe, 2009).

The proxy measure with trade of cultural goods also has a few limitations. With the development of the Internet and the rapid growth of e-commerce, many cultural goods have been converted to a digital form. As a result, consumers can now listen to music, read books, and watch movies online. However, the trade of materialized cultural goods may not capture the real flow of international trade. In the case of music in particular, many consumers visit YouTube to search for and enjoy various genres of music for free.

Therefore, a proxy measure for trade of materialized cultural goods may fail to estimate the recent cultural proximity. Another piece of evidence to support this is provided by the search counts from Google Trends, which show that although K-pop is gaining popularity worldwide, Korea's exports of recorded media (based on UNESCO's (2005) classification) has recently been decreasing (refer to Figure 1). These conflicting trends also highlight the need to further elaborate and understand this issue.
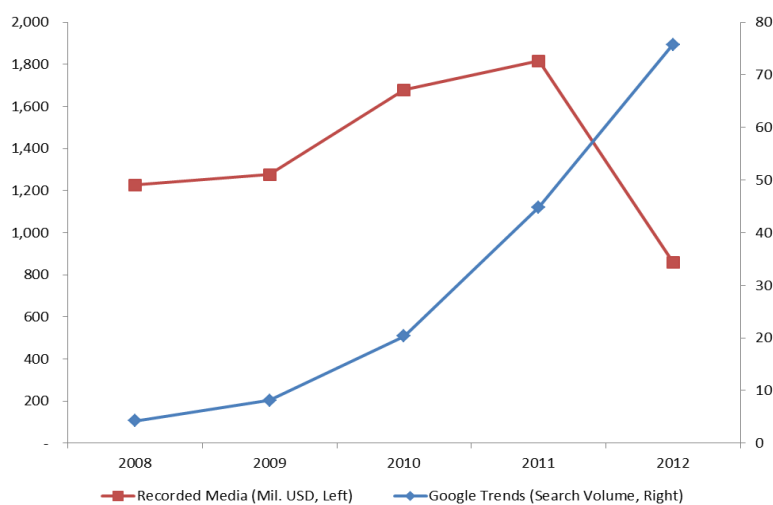

Figure 1.   Korea's exports of recorded media and K-pop search trends from Google Trends

3   METHODOLOGY

3.1   Data Collection

For data collection, we focused on the most-influential K-pop music videos on YouTube. Initially, we shortlisted K-pop idol groups and artists who are managed by K-pop's leading record labels (SM Entertainment, YG Entertainment, and JYP Entertainment). The stocks of these record labels are listed on the Korea Exchange. Other artists who were listed on the Apple iTunes' section of K-pop's popular artists were also included. As a result, we could identify the representative 179 K-pop idol groups or artists who debuted between 2002 and 2012.

Subsequently, we searched for the official music videos of the artists on our list on YouTube. These videos were uploaded by the record labels and entertainment agencies. Then, in terms of view counts, we sampled 53 K-pop artists and their 166 video clips that recorded at least one million view counts each on YouTube as of December 2012. Only those K-pop music videos that were uploaded from April 2009 to November 2012 were included in this sample.

Although YouTube provides general statistics for each video clip, such as overall view counts, simple audience demographics, and view trends, it does not provide detailed user information (e.g., their specific location). Thus, we can see the number of times that each K-pop music video has been viewed; however, we cannot identify the countries in which these viewers reside. To deal with this problem, we studied the comments section for each video clip.

YouTube permits its users to leave comments on video clips, and most users declare their country names in their personal accounts. If we click on a user ID in a specific comment, we can visit his/her personal account, and in most cases, we can obtain his/her country information. Through a Python-based Web crawler, we were able to collect users' comments on each K-pop music video and their country information.

The volume of Korea's exports was used as the dependent variable. Korea's export data was obtained from Korea's trade database, which is officially provided by the Korea International Trade Association (KITA) (http://www.kita.net) on a monthly basis. According to the Korea Customs Service, the popularity of K-pop has recently led to higher exports of consumer goods such as processed food, clothes, and cosmetics (Korea Customs Service, 2011). Thus, we retrieved this data based on the related classification of the HS Code. The collected data is summarized in Table 1.

Source	Data	Description	Type
YouTube	Video clip ID	K-pop music video clip ID	Text
	User ID	User ID of a user who has commented on a music video clip	Text
	Time of comment publication	Time when a user left a comment	Date
	ISO country code	User's country, which is declared in his/her account	Text
	Comment	The content of comments in each K-pop music video clip	Text
KITA	Korea's exports (Total exports, Food, Clothes, Cosmetics)	The volume of Korea's exports by period and by product type such as food, clothes (including hats, shoes, and accessories), and cosmetics (in USD and on a monthly basis)	Numeric

Table 1.   List of collected data

3.2   Descriptive Statistics

Through the Web crawler, we gathered approximately 1.2 million YouTube comments from 247 countries for 166 target music videos. In terms of the volume by countries, the US ranked first with

198,237 comments, followed by the Philippines (55,339 comments), Malaysia (37,762), Canada (36,324) and so forth as shown in Table 2. Based on data from Soompi (www.soompi.com), the largest K-pop content website in English, Dong-A Ilbo reported that in 2012, the top-10 countries in terms of website visits were the US, Malaysia, the Philippines, Indonesia, Singapore, Canada, Thailand, Australia, the UK, and Vietnam (Jeong & Kim, 2012). Soompi's list overlaps with the top-10 countries (except Korea) with the highest YouTube comments. Thus, we believe that YouTube comments can act as a proxy measure for YouTube view counts.

No.	Country	Number of YouTube Comments	No.	Country	Number of YouTube Comments
1	UNITED STATES	198,237	11	UNITED KINGDOM	18,215
2	PHILIPPINES	55,339	12	MEXICO	10,537
3	MALAYSIA	37,762	13	HONG KONG	10,324
4	CANADA	36,324	14	JAPAN	8,779
5	SINGAPORE	35,794	15	FRANCE	8,497
6	VIET NAM	33,987	16	TAIWAN	7,513
7	KOREA	27,329	17	PERU	7,045
8	THAILAND	24,990	18	BRAZIL	5,554
9	INDONESIA	22,040	19	NETHERLANDS	5,551
10	AUSTRALIA	19,530	20	SAUDI ARABIA	4,258

Table 2.   Highest ranked countries in the number of YouTube comments for K-pop music videos

However, we found that some users had uploaded multiple comments for each music video. To ensure that each user ID was considered only once, we deleted duplicate and different comments by the same user for each music video. Moreover, most of the music videos show that the number of comments rapidly decreases after 90 days of their publication, which reflects the limited influence of music videos over time. To capture this trend, we considered comments that were made within 90 days of publication. As a result, the total dataset of comments was reduced to 0.6 million.

Meanwhile, we excluded some countries (the United States, China, and Korea) from the final sample, because they appeared to have biased trends in our analysis. For example, many users declare their home country as the US to avoid restrictions by their local governments (Williams, 2009) or users simply retain the country data field as the U.S. without much consideration. Thus, the number of comments from the US is likely to show an upward bias. Moreover, although China is the foremost destination of Korea's exports, YouTube access in China is blocked for political reasons (Sommerville, 2009). Considering China's large population and geographical proximity to Korea, the number of comments from China (1,908) may underestimate the influence of K-pop popularity in China. Furthermore, in this analysis, we did not include the comments from Korea. Thus, we deleted the comments from the U.S., China, and Korea in the final dataset and focused on the top 100 countries in terms of the number of YouTube comments.

To capture meaningful trends in YouTube comments and Korean exports, we aggregated data on a quarterly basis, from the second quarter of 2009 to the third quarter of 2012 (14 quarters). We intended to use the number of YouTube comments as a proxy measure. However, since the number of music video releases vary over time, we developed a measure, COMMENT$_{i,t}$, which is calculated by the number of comments divided by the number of music videos per country i and time period t, and used this measure as the proxy measure. The descriptive statistics of the analysis dataset is shown in Table 3.

Variables	N	Mean	Std.Dev.	Min	Max
Total exports (USD)	1,400	713 Mil.	1.35 Bil.	0	10.5 Bil.
Exports of processed food (USD)	1,400	5.4 Mil.	20.0 Mil.	0	236 Mil.
Exports of clothes (USD)	1,400	15.8 Mil.	69.8 Mil.	0	725 Mil.
Exports of cosmetics (USD)	1,400	1.2 Mil.	4.5 Mil.	0	50.9 Mil.
No. of YouTube comments	1,400	307.51	889.94	0	8150
No. of K-pop music video clips	1,400	11.86	6.20	4	24
No. of comments/No. of clips per country and period	1,400	24.88	70.53	0	905.56

Table 3.   Summary statistics on a quarterly basis

3.3 Preliminary Analysis Model

To test the impact of YouTube comments on Korea's exports, we set up the following empirical model, as seen in Equation (1).

$$\text{EXPORT}_{i,t} = \text{COMMENT}_{i,t} + \text{COMMENT}_{i,t-1} + \text{YEAR}_k + \rho_i + \varepsilon_{i,t}, \tag{1}$$

where, i and t represent a country and a quarter, respectively. The dependent variable, $\text{EXPORT}_{i,t}$, has four variations: total exports, exports of processed food, exports of clothes, and exports of cosmetics from Korea to the country i. For independent variables, we included $\text{COMMENT}_{i,t}$ for the current quarter and $\text{COMMENT}_{i,t-1}$ for the previous quarter because real trade flow may be seen after a time lag. We added a fixed effect, ρ_i, which controls for unobserved, time-invariant idiosyncratic heterogeneity across countries. YEAR_k represents a year dummy in terms of the calendar year.

4 EMPIRICAL RESULTS

Table 4 shows the pooled Ordinary Least Squares (OLS) estimation results for total exports, exports of processed food, exports of clothes, and exports of cosmetics. The coefficients of $\text{COMMENT}_{i,t}$ and $\text{COMMENT}_{i,t-1}$ are all positive and significant at the 0.01 level, except for the lagged variable for processed food. This implies that an increase in the number of YouTube comments for each country in the current and previous quarters leads to an increase in Korea's exports.

	Total Exports	Processed Food	Clothes	Cosmetics
$\text{COMMENT}_{i,t}$	4816002**	35078.59**	122267.8**	13487.73**
	(754691.3)	(12089.53)	(41890.88)	(2655.527)
$\text{COMMENT}_{i,t-1}$	4238340**	23887.21	134901.7**	10040.39**
	(876318.9)	(14037.9)	(48642.1)	(3083.497)
Year dummies Included	Yes	Yes	Yes	Yes
R-sq	0.1771	0.0356	0.0529	0.1085
No. of obs.	1,300	1,300	1,300	1,300

Table 4.   Estimation by pooled OLS (**p < 0.01, * p < 0.05)

Considering the panel structure of our data, we applied the panel data models as seen in Table 5. To select a fixed or random effects model, we conducted a Hausman test under the null hypothesis in which the unique errors were uncorrelated with the regressors in the model (Hausman, 1978). The estimation results are slightly different from that of the pooled OLS. The coefficients of $\text{COMMENT}_{i,t}$ are all positive and significant at the 0.05 level. Moreover, the coefficients of $\text{COMMENT}_{i,t-1}$ are positive and significant at the 0.05 level, except for the lagged variable for processed food.

	Total Exports (FE)	Processed Food (RE)	Clothes (RE)	Cosmetics (RE)
COMMENT$_{i,t}$	1362837** (208166.3)	18102.96** (3598.493)	38409.52* (17183.37)	7063.388** (1060.244)
COMMENT$_{i,t-1}$	1206263** (238354.2)	7165.917 (4121.216)	47331.37* (19683.7)	4851.481** (1214.495)
Year dummies Included	Yes	Yes	Yes	Yes
R-sq	0.1629	0.0509	0.0278	0.1055
No. of obs.	1,300	1,300	1,300	1,300

Table 5.   Estimation by Fixed or Random Effects (**p < 0.01, *p < 0.05)

5   DISCUSSION AND CONCLUSION

Many studies in the field of international business have developed various proxy measures for cultural proximity between countries. However, the conventional proxies such as language, ethnicity, religion, and trade of cultural goods failed to capture the time-variant characteristics of cultural affinity or digitization of international trade. To take advantage of the expansion of the Internet and e-commerce, we attempted to develop an alternative proxy measure in social media like YouTube and empirically tested its impact on international trade. Theoretically, our study presented a different approach for measuring cultural proximity with data from emerging social media. From a practical perspective, it showed that cultural content on social media helps to improve a nation's image and boost its exports.

Meanwhile, we present some limitations of this study, which can be viewed as avenues for future research. First, comments on K-pop music videos may underestimate the impact of YouTube on Korea's exports. Owing to the unavailability of data for view counts by countries, we used the comment information instead. However, not all viewers leave comments, and therefore, the comment information is likely to underestimate the real impact of the K-pop music videos. Second, we did not analyze the content of the comments. Although most YouTube comments for K-pop music videos are positive, some users leave negative comments. However, we did not exclude negative comments through text mining because many comments were written in international languages (and not only in English). Third, this research only focuses on K-pop and Korea's exports. To generalize the results, the cultural content of other countries and the comments for such content need to be analyzed.

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