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Reference: Young, Seاون Park Trade in Cultural Goods: A Case of the Korean Wave in Asia.

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Trade in Cultural Goods: A Case of the Korean Wave in Asia

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This paper studies the effects of economic development and cultural proximity as common determinants of trade in cultural goods in a dynamic preference selection model. For the empirical analysis, this paper utilizes the gravity framework with importer fixed effects and Poisson pseudo-maximum likelihood estimators. This paper applies the model to Korean export of broadcasting contents to Asian countries. The relative economic development of the export country and the market size of the import country are important determinants of cultural trade, the results of which are generally consistent with traditional goods trade. However, the distance variable does not show much significance, reflecting the unique characteristics of trade in cultural goods.

Keywords: Korean Wave, Cultural Goods, Cultural Proximity, Broadcasting Contents, Gravity Equation

JEL Classification: F14, F10, D10

I. Introduction

Culture and cultural industries can be defined in many ways. According to the information in Wikipedia on “Economics of the arts and literature”, most of cultural art works such as books, recordings, and movies are reproducible and they are characterized by uncertainty on value, infinite variety, high concentration in trade products, short life cycle, and high fixed cost.

Traditional theories on international trade have been mostly concerned with trade in general products while ignoring the unique features of cultural products such as intangible aspects, minimal transportation cost, and preference selection. Only recently did some economists start to pay attention to the trade in non-traditional goods, particularly to trade in services.

Since trade in services and trade in cultural goods share in part common features, it is worth mentioning a few studies on service trade. Grunfeld and

Moxnes (2003) study the determinants of service trade and foreign affiliate sales using a gravity model and data from OECD. Their results found that the general pattern of the gravity model effects also applies to services. Economic size of the two countries is positively related and the distance between them are negatively related.

Kimura and Lee (2004) also apply the standard gravity framework to services trade. They found that compared with goods trade, distance between countries is more important in services trade. Lejour and de Paiva Verheijden (2004)'s comparison between goods and service trade between Canada and EU shows that distance is less important for services compared to goods.

The number of studies on cultural trade is very small and they have been limited to theoretical aspects of cultural identity. Janeba (2004) studies the effects of trade liberalization on cultural identity and shows that cultural diversity in the home market is not always beneficial in the case of free trade.

Rauch and Trindade (2005) study the consumption aspect of trade utilizing consumption network externalities. The concept of network externalities originated from the IT industry and it has been widely incorporated in economic modeling after the pioneering work of Kats and Shapiro (1985). Rauch and Trindade (2005) combine both the home market effect model of Helpman and Krugman (1985) in the supply side and consumption network externalities in the demand side to explain why some cultural goods dominate in other cultures. An interesting example is the clothing style of the tropical region. Because of Western cultural influence, we witness millions of necktie-wearing tropical businessmen and office workers despite the inappropriate weather condition.

The above mentioned research papers are purely concerned with theoretical modeling while Felbermayr and Toubal (2010) focus more on the empirical relationship between cultural proximity and international trade. In their research paper, Felbermayr and Toubal use the Eurovision Song Contest (ESC) as a proxy for cultural ties. The Eurovision Song Contest (ESC) is a big pan-European televised show in which each artist from a participating country performs a song. The other countries grade those songs and the winner is selected accordingly. The paper suggests that the results of the ESC significantly reflect how closely each country feels toward other European countries. After setting the ESC as a proxy cultural tie, they found that there is indeed a significant relationship between ESC scores and international trade. Whereas their research highlights the importance of cultural proximity in international trade, it does not deal with either trade in cultural products or the dynamic change of

preferences.

Blum and Goldfarb (2006) analyze data on Internet activities by US consumers on non-US websites. They show that trade in purely digital goods is significantly reduced by physical distance so that trade costs cannot fully account for the effects of distance on trade. Following the studies of Rauch (1996, 1999), they also found that even in trade in digital goods distance matters more in differentiated products than in homogeneous products.

Disdier, et al (2010) investigate the determinants of bilateral trade in cultural goods. They used the United Nations COMTRADE data and found that distance, common border, common language, and colonial links all show statistical significance in cultural trade. Disdier, et al (2010) also used trade in cultural goods as a proxy for countries' cultural proximity and found a positive and significant influence of cultural flows on overall trade. The drawback of their research is that the UN COMTRADE data they used misses a large portion of trade in cultural goods because of the intangible nature of the cultural goods and so the usefulness of the result is limited.

Research on cultural trade is rather active among Korean scholars because of the remarkable popularity of Korean cultural goods among Asian countries in recent years. The studies of Korean economists mainly focus on the trade diffusion effect of "The Korean Wave" (see, e.g., Kang, 2009; Choe and Park, 2008; Kim and Ahn, 2012).

Unlike the works of most Korean scholars, this paper instead delves into a more fundamental issue of the determinants of "the Korean Wave"- that is, what are the main reasons Korean cultural aspects such as life style, food, history, and fashion received so much attention among Asian countries in the last decade. This paper attempts to explain "the Korean Wave" in the broad picture of cultural trade by adopting the data analyses method in goods trade.

This paper adopts and extends the preference selection model of Bala and Van Long (2005). According to the model, if one economy is much larger than the other, then in the long run the distribution of preferences in the small economy under free trade will follow that of the big economy. The original model of Bala and Van Long (2005) describes a two-country and two-goods world, while this paper extends it to a three-country and three-goods world. The advantage of such a model extension is that it fits well in describing the case of Korean cultural exports. The rapid economic development of Korea changed the typical dynamics of trade between small country and big country.

This paper adopts a gravity-type econometric model with the importer fixed

effects estimator for the empirical analysis and uses the Korean export of broadcasting programs as trade data. In addition to the fixed effects estimator, the Poisson pseudo-maximum likelihood estimator is also used for robustness check and zero trade observations.

Since the trade information is a one-way flow from Korea to several countries, the empirical analysis focuses on the import countries' demand conditions. Regressors popularly used in gravity equations such as GDP and distance are included. The theory and empirical result with intuition suggest that Korean economic development and cultural proximity with neighboring countries are the two important factors for the sudden popularity of Korean cultural goods in Asian countries.

The contributions of the paper are a reinterpretation of the aspects of Korean cultural goods from the perspective of foreign consumers, modification of the economic model from two to three country conditions, and the usage of authentic data.

The second section of the paper reviews the "Korean Wave" phenomenon in general and TV dramas in particular. The third section presents the model and its extension. The fourth section describes the selected data. The fifth section presents the empirical estimators and results. The sixth section presents governmental policy implications, and the seventh section offers concluding remarks.

II. Korean Wave

In the past decade, many Asian countries have experienced the phenomenal rise of Korean cultural influence called "Hallyu" or the "Korean Wave" through numerous movies, TV dramas, and songs. The term "Hallyu" originated from Chinese media in the late 1990s as '韩流' to describe the sudden popularity of Korean TV dramas in China. Korean movies and TV dramas have been wildly accepted by neighboring countries such as China, Taiwan, Japan, and then later by many South East Asian countries.

Two of the most distinct TV dramas, 'Winter Sonata' and 'Jewel in the Palace (Tae jang gum)', are particularly worth mentioning. Originally produced and televised in South Korea in the winter of 2002-03, Winter Sonata became a great success especially in Japan. Winter Sonata and its romantic hero Bae Yong Jun resulted in an impressive economic impact in Japan generating US\$1.1 billion in 2004, mostly through the sale of items related to the drama. NHK,

the broadcasting company which broadcast the drama, sold 860,000 novels based on the drama's screenplay, 280,000 program guidebooks, and 150,000 DVDs and videos, and over 1 million copies of the drama soundtrack (Kim and Ryoo, 2007).

'Jewel in the Palace (Tae jang gum)', which was set in a historical period, appealed particularly to the Chinese people including those in Taiwan and Hong Kong. When 'Tae jang gum' aired in Taiwan from May to July 2004, for example, it became the most watched program of the season and when it aired on Hong Kong TV from January to May 2005, its final episode was recorded as the most-watched TV show in Hong Kong's history with a viewer rate of more than 40% (Kim and Ryoo, 2007). 'Jewel in the Palace' was later introduced to such culturally remote areas as Europe, Middle Eastern Islamic countries, and Africa and generated substantial interest in Korean culture.

The shape of the Korean Wave has noticeably changed in recent years. In the early 2000s, it was characterized by middle-aged housewives in East Asian countries watching television and DVDs. Recently Korean pop music, or K-Pop, has become the outstanding feature of the Korean Wave, and it is largely enjoyed by teenagers around the world. For example, Korean singer PSY's recent dancing video "Kangnam Style" on the YouTube website created an international sensation attracting more than 1 billion viewers from all over the world.

As a result of the Korean Wave, several Korean industries such as Tourism and beauty products gained great benefits. For example, 190,972 Thais visited Korea in 2009 and the figure rose to 309,143 in 2011 (Korea Tourism Organization 2013). Also, during the five year period from 2006 to 2011 the export of Korean skincare cosmetics to Thailand increased by more than 1000%, reaching US\$52.2 million in 2011.

An important aspect of the Korean Wave is that many successful Korean cultural products are a combination of Asiatic elements (tradition) and Western sophistication (modernity) creating their own uniqueness. For example, the hugely successful Korean drama 'Winter Sonata' depicts long lost values in a modern setting, while 'Jewel in the Palace' is a story of a woman's social ascendancy (modernity) against a historical background (tradition). A column in the Bangkok Post published in Thailand clearly captured such an aspect of Korean cultural products.

"Their soft products, from music to movies and TV shows, build upon the structure of Western pop-cultural content, digesting, localizing, intensifying and re-formatting it for export and GDP growth." (Bangkok Post, September 1, 2012)

Table 1. Korean export of cultural contents: 2009-2011

(Unit: US\$ million)

	2009	2010	2011	Rate(%)
China	581	749	1,118	27.0
Japan	664	803	1,247	30.1
South East Asia	458	672	796	19.2
North America	388	404	468	11.3
Europe	217	267	325	7.8
Others	126	157	189	4.6
Total	2,435	3,055	4,146	100

Source: Korean Creative Content Agency (KOCCA)

The data from Korean Creative Content Agency (KOCCA) in the above table 1 show that Korean export of cultural contents grows rapidly each year reaching 4.1billion dollars in 2011. Japan is the biggest importer of Korean cultural contents with 1.2 billion dollars in 2011. Asian countries including Japan, China, and South East Asia account for 76.3% of Korea's total export of cultural contents in 2011.

Table 2. Korean export of cultural contents per industry: 2011

(Unit: US\$ thousand)

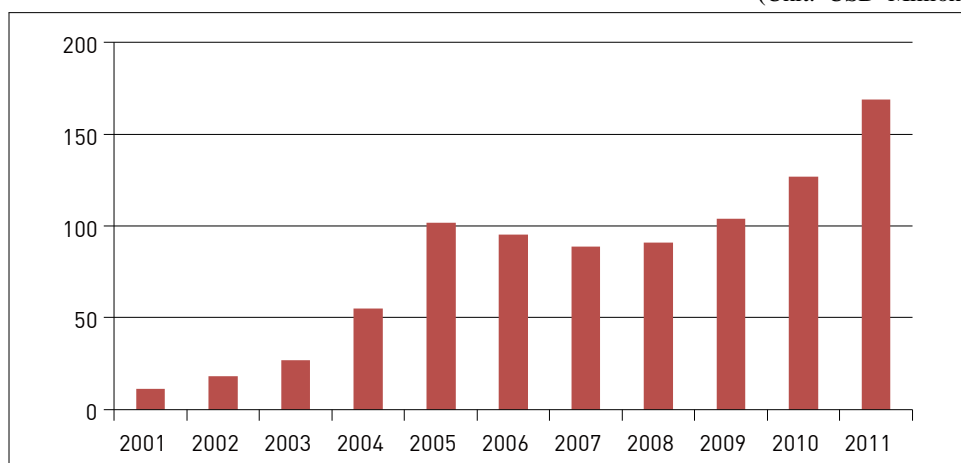
	China	Japan	South East Asia	North America	Europe	Others	Total
Publication	33,693	62,790	29,810	90,127	21,557	45,462	283,439
Cartoon	662	6,639	2,643	1,766	5,457	46	17,213
Music	6,836	157,938	25,691	587	4,632	429	196,113
Game	907,296	652,556	428,277	181,255	152,369	56,325	2,378,078
Movie	1,628	3,663	1,646	1,673	3,522	3,697	15,829
Animation	1,659	21,688	1,183	59,397	28,556	3,458	115,941
Broadcasting	21,268	105,058	38,432	3,562	1,479	2,139	168,940
Character	89,257	20,256	45,255	102,565	82,358	52,575	392,266
Knowledge Information	36,287	176,925	198,372	8,802	3,528	8,342	432,256
Contents solution	20,322	43,469	25,323	18,553	21,668	16,946	146,281
Total	1,118,908	1,247,982	796,632	468,287	325,126	189,419	4,146,356
Rate(%)	27.0	30.1	19.2	11.3	7.8	4.6	100

Source: Korean Creative Content Agency (KOCCA)

Table 2 shows Korean export of cultural contents per industry in 2011. The lion's share of cultural export comes from the game industry comprising 57.3 percent in the total export amount. Other important export industries are knowledge information (10.4%), character (9.4%), publication (6.8%), music (4.7%), broadcasting (4.1%), contents solution (3.5%), etc.

Figure 1. Korean export of TV programs: 2001-2011

(Unit: USD Million)



Source: Korea Communications Commission

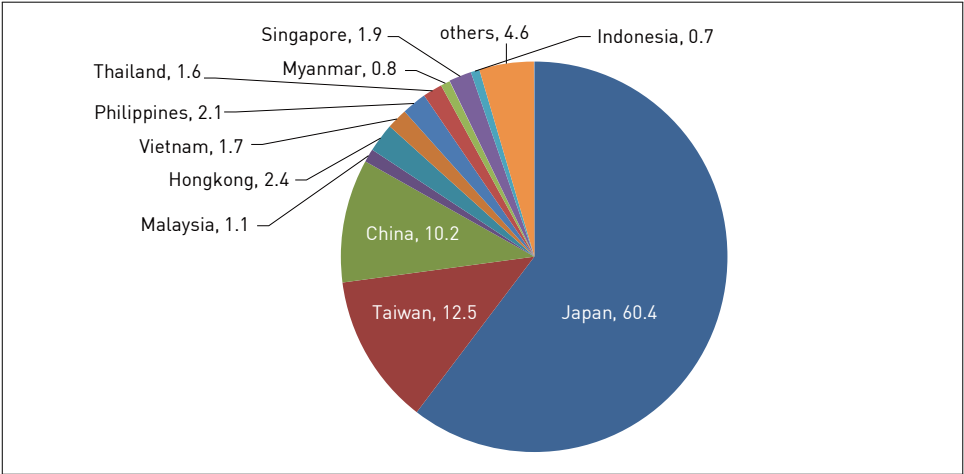
Figure 1 shows that the Korean total export of TV programs in terms of US dollar amount during the last eleven years (2001-2011) increased more than 16 times from 10.9 million dollars to 168.9 million dollars. The TV programs include not only dramas but also documentaries, animations, and show programs. The interesting part of the figure is that the peak year of 2005 coincides with the great popularity of the TV drama 'Jewel in the Palace (Tae jang gum)' throughout the Asian region.

The export trend as shown above is the result of increasing demand from both existing and new markets. For example, the Korean export of TV programs to Japan increased from 1.1million dollars in 2001 to 102 million dollars in 2011, while the number of foreign countries importing Korean broadcasting content over \$100,000 increased from 8 countries in 2001 to more than 20 countries in 2011.

Figure 2 and 3 show the Korean export share of TV programs for each country based on the dollar amount and program numbers in 2011, respectively. Japan

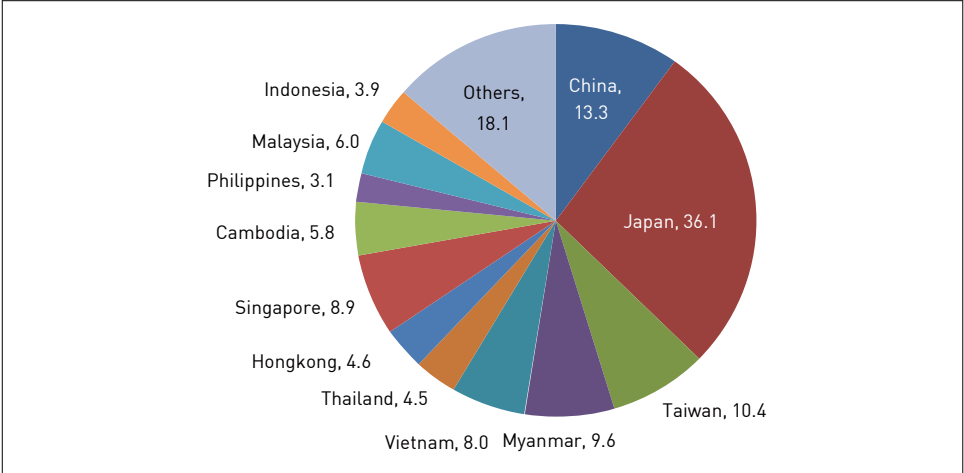
is the biggest importer of Korean TV programs with a 60.4% share in terms of the dollar amount and 36.1% share in terms of the number of TV programs. The reason why there are discrepancies in each country’s import share of dollar

Figure 2. Korean export share of TV programs per country based on dollar amount as of 2011



Source: Korea Communications Commission

Figure 3. Korean export share of TV programs per country based on program numbers as of 2011



Source: Korea Communications Commission

amount and number of programs is that the import prices of the TV programs in each country are different. The price of the goods exported to the higher GDP per capita countries tends to be higher than that to the lower GDP per capita countries. Other than Japan and China, major importing countries are Taiwan, Hong Kong, and South East Asian countries.

III. Model

This section adopts and extends the model of preference selection from Bala and Van Long (2005). The model is based on the alteration of tastes over time due to social influences and habit formation. The model provides a general equilibrium formulation, with relative price in the competitive equilibrium being allowed to influence the future distribution of tastes in the society as a whole. The desirable aspect of the model is that it explains the process of consumer preference change over time in a conceptually simple way.

The model first considers a closed economy with two goods (apples and bananas) and two types of individuals (apple lovers and banana lovers). In home country H , each individual is born with an endowment vector $(1, k)$ (one apple, and k bananas). In the foreign country F , each individual is born with an endowment vector $(\delta, 1)$ (one banana and δ apples). The population in H is $N_t = N$ and the population in F is $M_t = M$. The parameter $m = M/N$ reflects the relative size of country F .

The dynamic evolution for the home country under autarky is given by

$$r_{t+1}^H = \frac{r_t^H}{r_t^H + (1 - r_t^H)p(r_t^H, k)}$$

where r_t denotes the proportion of apple lovers in the population at time t and $p(r_t^H, k)$ is the home country market clearing price under autarky. If $k \geq k^B$, then in the long run, under autarky, banana lovers will dominate. On the other hand, if $k \in (k^A, k^B)$, then the home country will exhibit heterogeneous preferences in the long run.

In the case of the foreign country in isolation, the evolution in this country is given by

$$r_{t+1}^F = \frac{r_t^F}{r_t^F + (1 - r_t^F)p(r_t^F, 1/\delta)}$$

where $p(r_t^F, 1/\delta)$ is the foreign country market clearing price under autarky. There exist two positive numbers δ^A and δ^B such that the self-sufficiency price ratios for the two types of consumers are

$$p^A(1/\delta^A) = 1 \text{ and } p^B(1/\delta^B) = 1$$

where $\delta^A > 1 > \delta^B$. If $\delta \geq \delta^A$, then under autarky, in the long run the preferences of apple lovers will dominate in country F . If we have $k \geq k^B$ and $\delta \geq \delta^A$, the proportion of banana lovers in the home country will be close to unity, while the proportion of apple lovers in the foreign country will be close to unity.

Let $p^w(r^H, r^F, k, \delta, m)$ denote the world market-clearing price, where m is the relative population size of country F . In this world economy, the dynamics are given by a system of two difference equations:

$$r_{t+1}^H = \frac{r_t^H}{r_t^H + (1 - r_t^H)p^w(r_t^H, r_t^F, k, \delta, m)}$$

$$r_{t+1}^F = \frac{r_t^F}{r_t^F + (1 - r_t^F)p^w(r_t^H, r_t^F, k, \delta, m)}$$

For any given initial vector (r_t^H, r_t^F) , there exists an $m^* > 0$ such that if $m > m^*$, then in the long run there will only be apple lovers in each country.

The intuition behind the above assertion is that if the foreign country endowed with a large portion of apples is much larger than the home country, the equilibrium price of apples under free trade will be very low and consequently the banana lovers in both economies will disappear. The model can be adopted to explain why Korean cultural products recently became popular in the Asian region. Nevertheless, there are a few extensions to be made on this model.

Firstly, Bala and Van Long (2005) assume the evolutionary changes of

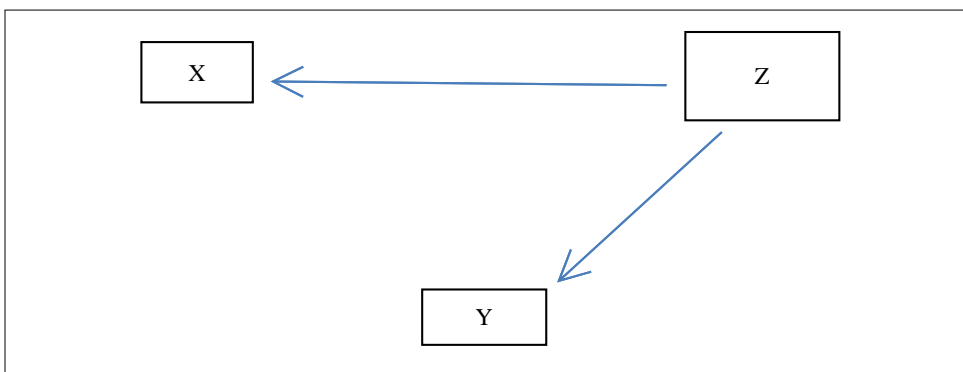
preferences over several generations, whereas the phenomenon of Korean Wave happened in a relatively short period of time. To explain the cause of such consumer change in a short time, we assume that each exposure to cultural influence alters and reinforces the propensity of each consumer's behavior in his lifetime. The best example is consumer exposure to TV commercials. The more consumers watch TV commercials by a particular brand, the more they become aware of the brand and more likely to buy the advertised products.

Secondly, in addition to the population and endowed goods, the size of the economy in each country can also be considered since GDP is one of the main determinants in international trade.

Thirdly, instead of a two-country and two-product model, we can consider the case of three countries and three products. The model of three countries can explain the transformation of an economically small country to a big country and the ensuing changes in dynamic interactions among big, small, and small to big countries. An additional product of mixed characteristics embodies the product feature acceptable to consumers with different preferences.

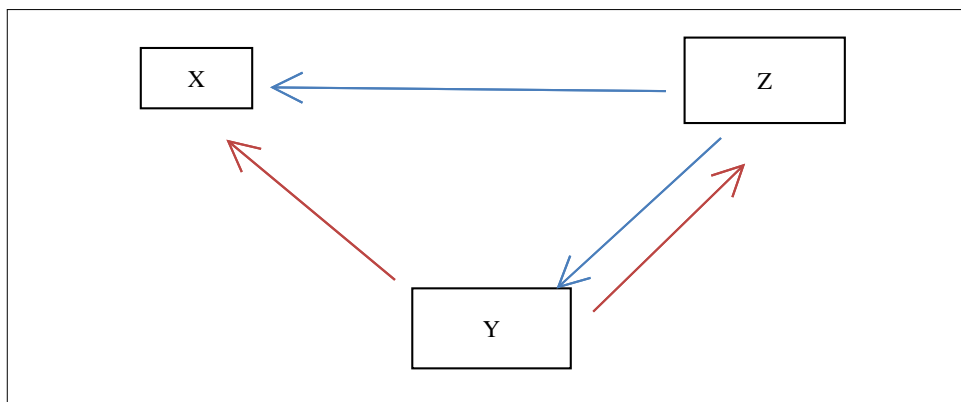
For the model extension, we can consider the case of three countries, X, Y, and Z, where the economic size of Z is much bigger than that of X and Y. We consider only two time periods, t and $t+1$ so that the idea can be presented in a simple form while maintaining the dynamic aspect of the model. In period t , the proportion of banana lovers in X and Y is close to unity, while the proportion of apple lovers in Z is close to unity. In period t , Z exports apple to X and Y because its economic size is much bigger than that of X and Y, which is in line with the model of Bala and Long (2004).

Figure 4. The flow of international trade in period t



In period $t+1$, the preferences of the old generation in X and Y remain unchanged, while those of the young generation in X and Y change, that is, they now prefer apples to bananas. We assume that during period t and $t+1$ the economy of Y grows faster than that of X and Z. We also assume that as the economy of Y grows faster than that of other countries, its production competitiveness also improved and thus Y can now also export its own product, mixed cans of apples and bananas, which is acceptable for both apple lovers and banana lovers. The change of trade flows in period t and period $t+1$ are depicted in Figure 4 and Figure 5.

Figure 5. The flow of international trade in period $t+1$



The dynamic preference evolution for country X under autarky is given by

$$r_{t+1}^X = \frac{r_t^X}{r_t^X + (1 - r_t^X)p(r_t^X, k)}$$

where $p(r_t^X, k)$ is the country X's market clearing price under autarky.

Let $p^w(r_t^X, r_t^Y, r_t^Z, k, \delta, \varepsilon, m, g)$ denote the market clearing world price in which ε is the relative supply of apple-banana mixed can from country Y and g is the relative economic size of country Y and Z. k and δ are the relative proportion of apples and bananas just as they were in the original model. In this world of free trade economy, the dynamic preference evolution for country X is given by

$$r_{t+1}^X = \frac{r_t^X}{r_t^X + (1 - r_t^X) p^w(r_t^X, r_t^Y, r_t^Z, k, \delta, \varepsilon, m, g)}$$

For any given initial vector (r_t^X, r_t^Y, r_t^Z) , there exists a $g^* > 0$ such that if $g^Y > g^*$, then in the long run there will be a greater proportion of apple-banana mixed can lovers in country X.

In this model, country X, Y, and Z can be represented as Thailand, Korea, and the U.S. respectively and apple lovers are those who prefer western-style cultural products, while banana lovers are those who prefer Asian traditional elements. Korean cultural products are symbolized by apple-banana mixed can showing its mixed characteristics of Asiatic tradition and western sophistication. The advantage of such a model extension is that its feature is suitable to the Korean export of cultural goods.

IV. Data

The study analyzes Korean export of broadcasting contents to 11 Asian countries during the period from 2001 to 2011 collected by the Korea Communications Commission. Starting from 2001, the Korea Communications Commission has annually collected various data on the Korean broadcasting industry by conducting a survey on every company engaged in this business and has published the results in the form of industry yearbooks. The export data in this material is thus much more focused on a specific industry and reliable than any other trade data available. For example, most classifications of cultural products are based on the HS CODE and the problem of the HS CODE is that they count only tangible goods cleared through the customhouses, while a considerable portion of cultural products cross the border without leaving any statistical evidence. According to the Contents Industry Statistics compiled by the Korean Creative Content Agency, among the total export of Korean cultural contents in 2010 only 39.9% are final tangible products such as CDs and tapes, while the remaining forms of export are licenses, OEM exports, and technology services.

Table 3. Korean export of broadcasting content in the selected years

Country	2001		2005		2011	
	\$ thousand	No of program	\$ thousand	No of program	\$ thousand	No of program
Japan	1,157	2,482	63,543	7,271	102,058	15,147
China	2,700	1,142	9,238	4,099	17,241	5,578
Hong Kong	1,117	903	3,232	1,075	4,027	1,921
Singapore	858	674	1,030	934	3,259	3,713
Taiwan	2,232	2,814	11,872	2,003	21,051	4,377
Vietnam	318	586	962	1,152	2,796	3,351
Malaysia	0	0	1,336	736	1,814	2,501
Indonesia	0	0	1,144	607	1,246	1,625
Thailand	0	0	2,327	1,392	2,785	1,895
Philippines	0	0	3,994	1,244	3,549	1,310
Cambodia	0	0	0	0	516	2,431
Others	2,524	3,478	3,948	1,112	8,598	11,587
Total	10,906	12,079	102,626	21,625	168,940	55,436

Source: Korea Communications Commission

* In number of program column, each episode of drama is counted as one program. So if one TV drama consists of 30 episodes, it is counted as 30 programs.

The limitation of the studied data is that they contain only bilateral trade information between Korea and foreign countries lacking the information of transactions among other foreign trading partners. Thus the data cannot be used for analyzing multilateral trade relations among the countries, but they are sufficient to analyze trade relations between Korea and foreign countries.

Among cultural goods, broadcasting contents are the most appropriate data for evaluating the level of cultural influence because they were a number of Korean TV dramas that triggered the Korean Wave in many Asian countries in the first place and TV dramas embody rich cultural traits such as family relationships, social interaction, history, the latest trend, food, and fashion.

The observed 11 countries that import Korean broadcasting content are Japan, China, Hong Kong, Singapore, Taiwan, Vietnam, Malaysia, Indonesia, Thailand, the Philippines, and Cambodia. The reason why these specific 11 Asian countries were selected is that they are the major import countries of Korean broadcasting contents throughout the period of 2001-2011. Myanmar is excluded in the analysis simply because much important statistical information of Myanmar in

the 11 year period is not available. Table 3 shows the Korean export of broadcasting content to the 11 countries in the selected three years. In 2011, Japan commands the biggest share of importing TV contents from Korea with 102 million dollars or 15,147 programs.

Table 4. Data description

Variables	Obs.	Mean	Std.Dev.	Min.	Max.
$Export1_{ijt}$ (\$ amount)	121	6953.7	15566.2	0	102058
$Export2_{ijt}$ (No of program)	121	2072.5	2517.5	0	15147
$Distance_{ij}$	121	2997.0	1434.2	955	5290
$Population_{jt}$	121	181.26	363.77	4.1	1344
$GDP\ per\ capita_{jt}$	121	11.59	13.90	0.325	46.862
$Internet_{jt}$	121	30.89	25.08	0.08	78.71
GDP_{jt}/GDP_{kt}	121	1.0675	1.9368	0.01	8.25
$Korean_{jt}$	121	307.6	694.8	1	2750

Table 4 shows the data description in which the total observed number of variables is 121. Distance information measured in kilometers between the Korean capital city, Seoul, and the capital cities of import countries is from www.mapcrow.info. The distance variable has been an integral part of the gravity equation and analysis of trade patterns. In the analysis of cultural trade, distance represents more intangible barriers such as cultural remoteness than simple transportation cost.

The data of GDP, population, and Internet are from the World Bank Database. Overseas Korean population statistics compiled by Korean Ministry of Foreign Affairs is also added because it can be a proxy of cultural ties between Korean and import countries.

GDP and population can represent the development level and the size of each country respectively. Since GDP contains the element of population, this paper instead used both GDP per capita and population while the GDP of import countries was also used to measure the relative economic size of the import country against that of Korea.

Internet usage per 100 people in import countries represents the development level of social infrastructure in the import country. The reason why internet is included is that recently cultural goods, especially broadcasting contents, have

spread very rapidly among consumers through internet websites such as YouTube and Facebook. Overseas consumers' watching Korean TV contents through the Internet websites in the import countries might cause a negative influence on overall exports. However, this paper reasons that the Internet can become a catalyst for consumer awareness of Korean broadcasting contents.

V. Empirical Analysis

This paper adopts a gravity-type equation to measure the determinants of Korean cultural exports to Asian countries. The gravity model has become a norm in applied international trade studies. The gravity model's popularity is because the concept is simple and it fits the data well.

Tinbergen (1962) originally applied the gravity model to international trade and as in the mechanical law of Newton the model predicts that the trade between two countries is a function of their economic size and the distance between them. Anderson and van Wincoop (2003) show that incorporating multilateral resistance measures can greatly improve the estimation. The reason why this paper adopts gravity type equation is that important variables such as GDP and distance in the traditional gravity equation overlap the variables of the model in this paper.

The dynamic preference selection model described in the previous section focuses on demand conditions of import countries and, according to the model, the major determinants of cultural trade are relative economic size and population between trading partners. An import country's GDP per capita implies market power. The internet variable represents consumer awareness and searching cost. The Korean population in each import country is added for the cultural proxy between Korea and import countries. Although transportation cost is minimal in the trade of cultural goods, the distance variable is added as a proxy of cultural distance between Korean and each import country. The hypothesis is that as the geographical distance between two countries grows, the cultural barriers and ensuing difficulties of cultural trade between them also increase.

Some variables such as adjacency, language, colony, and FTA that appear in the typical gravity equations are excluded taking into consideration the limited variety of countries the data covered. This paper assumes that the Korean export of cultural goods has a positive relationship with the relative economic size of Korea, import country's population, import country's GDP per capita,

overseas Korean population, and Internet usage, while it has a negative relationship with distance.

The following empirical model incorporates the ideas and variables shown in section 3. For example, the relative economic size of import and export countries (g), population variable (m), and Korean population and distance as the cultural proximity and transaction cost are listed in the empirical model.

$$\ln(\text{export}l_{kjt}) = \alpha + \beta_1 \ln(\text{GDP}_{jt}/\text{GDP}_{kt}) + \beta_2 \ln(\text{population}_{jt}) + \beta_3 \ln(\text{gdppc}_{jt}) + \beta_4 \ln(\text{internet}_{jt}) + \beta_5 \ln(\text{distance}_{kj}) + \beta_6 (\text{Korean}_{jt}) + \varepsilon_{kjt}$$

In the above equation, ‘ln’ represents a natural logarithm. $\text{Export}l_{kjt}$ is the Korean export of TV programs to country j in terms of the dollar amount in the observed period t . distance_{kj} is the geographical distance between the capital city of Korea and that of the import country j . population_{jt} is the population of country j . gdppc_{jt} is the GDP per capita in country j . Internet_{jt} is the number of internet users per 100 in country j . $\text{GDP}_{jt}/\text{GDP}_{kt}$ is the GDP ratio of country j to Korea. Korean_{jt} is the Korean population with 1000 unit in country j . Finally, ε_{kjt} is the residual. This paper expects that the sign of $\ln(\text{distance}_{kj})$ and $\ln(\text{GDP}_{jt}/\text{GDP}_{kt})$ will be negative, while the sign of other variables will be positive.

Table 5 shows pairwise correlations for the dependent variable and regressor variables where export is most highly correlated with distance, relative GDP size of the import country, and the internet. Among the regressors, internet usage and GDP per capita are highly correlated. The sign of relative GDP size is positive contrary to expectations. It is due to the single variable correlation results and with proper regression treatments as shown in Tables 6 and 7 the sign changes to be negative.

Table 5. Correlation matrix

	$\ln(\text{export}l)$	$\ln(\text{distance})$	$\ln(\text{gdppc})$	$\ln(\text{population})$	$\ln(\text{gdpgdpk})$	$\ln(\text{internet})$	$\ln(\text{Korean})$
$\ln(\text{export}l)$	1.0000						
$\ln(\text{distance})$	-0.6854	1.0000					
$\ln(\text{gdppc})$	0.5931	-0.2723	1.0000				
$\ln(\text{population})$	0.1866	-0.4065	-0.4570	1.0000			
$\ln(\text{gdpgdpk})$	0.6832	-0.6681	0.4539	0.5740	1.0000		
$\ln(\text{internet})$	0.6111	-0.1964	0.7735	-0.2471	0.4355	1.0000	
$\ln(\text{Korean})$	0.4475	-0.6052	-0.0172	0.7549	0.7247	0.1071	1.0000

For the gravity model estimation, Anderson and van Wincoop (2003) show that incorporating multilateral resistance measures is necessary. Among several approaches to deal with multilateral resistance, this paper follows Baldwin and Taglioni (2006) and includes importer fixed effects interacted with year dummies. To check robustness and deal with zero trade observations, this paper also uses the Poisson pseudo-maximum likelihood estimator (PPML) presented from Santos Silva and Tenreyro (2006, 2011). There are a number of desirable aspects of the Poisson estimator. Firstly, in the presence of fixed effects, PPML is consistent. Secondly, it includes the observations of zero trade value. Thirdly, it follows the same pattern as OLS and the interpretation of the coefficients is straightforward.

Table 6. Dependent Variable: Log Export1 (OLS, FE), Export1 (PPML)

Variable	OLS	FE		PPML	
		(1)	(2)	(1)	(2)
Ln distance	-1.4197*** (0.1409)	-2.3488* (1.2753)	-2.3530 (1.4338)	-3.9804 (6.9114)	-4.1311 (5.2441)
Ln GDP per capita	2.3454*** (0.3002)	2.3667*** (0.5798)	1.8823** (0.8265)	2.5229*** (0.2653)	5.0056*** (1.4580)
Ln population	2.2610*** (0.3065)	2.0222 (1.4182)	-0.3322 (2.4278)	2.9702 (5.0224)	7.8169* (4.0923)
Ln GDP _j /GDP _k	-1.9446*** (0.3055)	-2.6968*** (0.8214)	-2.4423*** (0.7467)	-2.5685*** (0.1230)	-5.4377*** (1.3524)
Ln Internet	0.2931*** (0.6370)	0.1116 (0.0647)	0.0351 (0.0827)	0.3149* (0.1617)	0.1632 (0.1283)
Ln Korean	-0.1156** (0.4754)	0.2297 (0.3169)	0.1366 (0.3017)	-0.1649 (0.4223)	-0.5527 (0.4604)
Constants	3.3550 (2.0947)	11.0335 (6.6379)	24.3233 (10.9911)	19.3858 (69.2739)	-3.3211 (53.5025)
Importer fe	No	Yes	Yes	Yes	Yes
Year fe	No	No	Yes	No	Yes
Observations	112	112	112	121	121
Adjusted R ²	0.8231	0.8729	0.8962	0.8898	0.9611

*, **, *** denote statistical significance at the 90, 95, and 99 percent levels, respectively.

We first estimate the determinants of Korean exports of cultural goods in value terms. Table 6 presents the results with the dollar amount of exports as

a dependent variable. Importer fixed effects interacted with year dummies are included in all the regressions. OLS results show statistical significance in all the variables. However, the results of fixed effects and PPML estimations show that some variables are not relevant in Korea's export of broadcasting contents at all.

The GDP per capita of import country variables show positive signs and statistical significance in most of the estimators. However, population of import country shows only slight statistical significance in the PPML (2) column and no importance at all in other estimators. The implication is rather clear. While the import country's market size is an important factor in Korean cultural export, when it comes to export amount, GDP per capita is more important than the population of the import country.

GDP_{jt}/GDP_{kt} clearly shows a negative sign and statistical significance in all the columns, suggesting that in cultural trade an economically bigger country becomes a net exporter, while smaller countries become net importers.

Distance shows negative signs in all the estimators as expected. While FE(1) indicates a slight significance of distance, other estimators show no statistical significance of distance. This result is markedly different from the results of most of the conventional gravity estimations of general goods. The result is both understandable and still perplexing. The possible first implication is that since the transportation cost of broadcasting contents is almost nil, distance simply does not matter. The second implication is that even though distance embodies cultural barriers, the investigated 11 import countries are not heterogeneous enough from a cultural perspective.

The Internet usage of the import country shows weak statistical significance in the PPML(1) column and no significance in other estimators, indicating that the development of multimedia and social networks in the import countries has a weak positive influence on cultural trade. Overseas Korean population in import countries does not show any meaningful results, implying that the Korean connection is a weak representative of cultural ties.

Table 7 presents the results with export of Korean broadcasting contents in terms of the number of episodes as a dependent variable. Importer fixed effects interacted with year dummies are also included in all the regressions.

The striking difference of the results in Table 7 compared with those in Table 6 is that the population variable in the import countries shows statistical significance in most of the estimators except for the FE(1) column. Once again the implication is rather clear. The import concentration of the broadcasting

contents in the countries with higher GDP per capita is much decreased if we measure the products in terms of the quantity rather than dollar value. The implication is also made clear by comparing the Figures 2 and 3.

As in the results of Table 6, import country's GDP per capita and GDP_j/GDP_k show strong statistical significance. While some estimation results in Table 6 show slight significance of distance and import country's internet usage, the results in Table 7 do not show any importance in either variable. Korean population in import country also does not reveal any meaningful conclusions.

Table 7. Dependent Variable: Log Export2 (OLS, FE), Export2 (PPML)

Variable	OLS	FE		PPML	
		(1)	(2)	(1)	(2)
Ln distance	-0.8975*** (0.1824)	-1.5268 (1.3667)	-1.7130 (1.4194)	4.5767 (3.6645)	1.0900 (3.8580)
Ln GDP per capita	1.7761*** (0.3058)	1.7919*** (0.3899)	2.7062*** (0.4768)	1.7030*** (0.4526)	4.0440*** (0.7771)
Ln population	1.6080*** (0.2936)	3.2261 (1.8174)	3.3074** (1.5112)	4.3029* (2.4624)	6.3402*** (2.4544)
Ln GDP_j/GDP_k	-1.5749*** (0.2861)	-1.2735*** (0.2851)	-2.3262*** (0.4087)	-1.2389*** (0.2427)	-3.8615*** (0.6566)
Ln Internet	0.0423 (0.0940)	0.0551 (0.1315)	0.0136 (0.1012)	0.1014 (0.1551)	0.0458 (0.1457)
Ln Korean	0.0510 (0.0774)	-0.1134 (0.3892)	-0.2074 (0.4198)	-0.2827 (0.3198)	-0.4864 (0.3483)
Constants	2.9161 (2.1690)	0.1766 (5.3293)	0.9784 (7.2609)	-46.7680 (36.0119)	-33.4201 (35.9901)
Importer fe	No	Yes	Yes	Yes	Yes
Year fe	No	No	Yes	No	Yes
Observations	112	112	112	121	121
Adjusted R^2	0.7132	0.8143	0.8398	0.8227	0.8763

*, **, *** denote statistical significance at the 90, 95, and 99 percent levels, respectively.

VI. Policy Implications

The research results in the paper show that while cultural trade in Asia follows a similar pattern as goods trade, the distance and overseas Korean population as cultural ties display little significance. This result, at first glance, contradicts

the theory of economic growth and cultural closeness as the two crucial factors for Korean export of cultural goods. However, recognizing the small transportation cost of the broadcasting wave, the culturally homogenous characteristics of the investigated 11 countries, and the fact that those 11 countries occupy 95% of all the Korean exports to the world clearly manifest the importance of cultural ties in the export of the broadcasting contents. In fact, according to the trade statistics by Korea International Trade Association (KITA) of the total Korean exports in 2011, the export to Asian countries occupies 56.5%, a considerably lower rate than the export rate of broadcasting contents. For government policy makers, the case of the Korean Wave provides the following policy implications.

Firstly, because the rise of the Korean Wave coincides with the fast economic development of Korea, it should also be recognized that the phenomenon of the Korean Wave can be short-lived if other neighboring economies such as China grow faster than Korea's. When Japan's economy dominated the world a few years ago, Japanese cultural influences such as Japanese animation, drama, and J-pop also gained great popularity throughout the world. At the moment the Korean economy and Korean cultural influence on neighboring countries is strong, but Chinese domination in economic and cultural influence in the near future seems inevitable.

Secondly, as we understand that cultural influence happens through the dynamic combination of economic power and cultural proximity between import-export countries, it will take more time and effort for the Korean Wave to flow out of Asia. The huge success of PSY's "Kangnam Style" suggests that the production of cultural goods that suit universal tastes (i.e. comic factor) rather than traditional tastes is a way to overcome cultural barriers.

Thirdly, the fact that the major importer of Korean cultural goods is Japan, whose economic size is bigger than that of Korea, suggests that the relative economic size itself is not an absolute condition for cultural trade. On top of Korea's economic development, the combination of unique contents, government support, social networks, and domestic competition contributed to the rise of the Korean Wave that captivated hundreds of millions of people.

Lastly, as evidenced by the data and empirical analysis, the import country's demand of cultural contents can be measured either by a value term or by a quantity term. The results show that import country's market power measured in GDP per capita is important in the value term, while import country's market power measured in population is also a relevant factor in the quantity term.

Considering the high average economic growth rate of low income countries, future value creation by Korean export of cultural goods will increasingly come from those emerging markets.

VII. Conclusions

This paper analyses the determinants of the sudden popularity of Korean cultural products in overseas markets and their implications. In a dynamic preference selection model, this paper indicates that both relative economic size and cultural proximity affect the international trade of cultural goods. Based on the original model of Bala and Van Long (2005), this paper extends the model to a three-country and three-good model to explain the unique position of the Korean economy; Korea has been transformed from a net importer to a net exporter of cultural goods in a considerably short period.

Empirically, this paper adopts a gravity-type econometric model and applies the importer dummy fixed effects and the Poisson pseudo-maximum likelihood estimator to analyze the determinants of the Korean export of broadcasting contents to 11 Asian countries.

This paper finds that while an import country's economic size is important, the relative size of the export country compared to that of the import country is also an important factor for cultural trade. Internet usage in the import country shows weak relevance and overseas Korean population as a proxy of cultural ties does not show any statistical significance.

The results also show a weak significance of geographical distance in cultural trade. On the surface the result can be reasonably accepted because cultural goods such as TV contents do not generate much transportation cost. However, the result is also counterintuitive since distance can be a proxy for cultural barriers between export and import countries. One possible explanation is that the analyzed data cover only trade between Korea and Asian countries and thereby culturally and geographically remote countries are already excluded.

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First version received on 6 February 2014

Peer-reviewed version received on 10 March 2014

Final version accepted on 18 March 2014

