

# Consumer Animosity to Foreign Product Purchase: Evidence from Korean Export to China

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JKT 24(6)

Received 29 April 2020

Revised 10 June 2020

Accepted 7 September 2020

## Abstract

**Purpose** – This paper examines how the consumer animosity of partner country influences the purchase of foreign products. We analyzed news sentiment to determine whether Chinese consumer's animosity affect the purchase of the products made in Korea around the time when the U.S. Terminal High Altitude Area Defense missile system was deployed in South Korea.

**Design/methodology** – To measure the tone of Chinese consumer animosity more carefully, we utilized a text mining technique of the Chinese language to read the public's opinion. Using Chinese news paper's editorials of 2015.1-2018.10, we analyzed the sentiment toward Korea and regressed it with Korean export to China.

**Findings** – Empirical results report that Chinese consumers tended to reduce their purchase of consumer goods from Korea when the animosity increased, that is, the sentiments of Chinese news editorials were negative. In contrast, the animosity did not affect the purchase of Korean intermediates or raw materials. We further analyzed the effect by dividing the animosity into three categories; politics, economics, and culture. Among these groups, political news exhibits a unique effect on Chinese purchase on consumer goods from Korea.

**Originality/value** – Existing literature on animosity models has measured the animosity by collecting the consumers' opinions through survey at a given time point, whereas it is measured by analyzing the tone of the press release by sentiment analysis during the time period around the event occurrence in this study.

**Keywords:** China, Consumer Animosity, Political Conflict, Sentiment Analysis, South Korea

**JEL Classifications:** F14, F18, F51, F52

## 1. Introduction

The impact of cross-national relations on bilateral trade has been an important research topic in several areas, including international business, economics, and politics. Klein, Ettenson and Morris (1998) proposed an animosity model, wherein they argued that animosity, 'the remnants of antipathy related to previous or ongoing military, political, or economic events', can influence consumers' willingness to buy foreign products. Since then, the animosity model approach has become a representative cognitive science tool to explain consumers' purchase behavior in international markets when they have country-specific animosity. Modified and extended versions of the animosity model have been suggested in numerous articles (Kalliny and Lemaster, 2005; Kalliny et al., 2017; Lee Je-Hong, 2018; Nijssen and Douglas, 2004).

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Recently, some studies have attempted to examine cross-country political conflict and its impact on trade independent of survey-based animosity literature. They focused on measuring the effect of political conflict using versatile methods other than surveys. One strand of the research utilized a dummy variable method or its modified version, or a difference-in-difference (DID) approach (Heilmann, 2016; Wan, Lian and Chen, 2019). Meanwhile, Pandya and Venkatesan (2016) examined the frequency of anti-counterpart-country negative news in the host country. Du et al. (2017) developed their own index to measure political conflict conveyed by newspapers. They identified political events in newspapers and reflected them in their model assigning weights according to event severity.

To the best of our knowledge, there was no paper on how political, economic and cultural sectors affect exports dynamically. It was hard to find a proxy to measure politics, economy and culture in time series basis. In the existing literature, consumers' animosity for an event is typically measured via survey research, and the effects before and after an event are analyzed using the DID method. However, consumers' animosity may dynamically change in due course according to the changing social opinions about the event. In this paper, we suggest a new approach to address the shortcomings of extant literature in terms of measuring animosity by applying sentiment analysis, a text mining scheme, to a time series based on daily newspapers. The collected positive and negative sentiments expressed in newspapers were examined and employed to measure the extent to which political conflict affects trade.

We aimed to explain how Chinese consumers reduced their purchase of Korean products after Terminal High Altitude Area Defense (THAAD) deployment under the animosity mode. China's import growth is an inevitable result of the rapid development of its economy, and the Chinese government has also proposed expanding imports in various policies (Wei and Zhao, 2015). As a result, China's global influence as a huge importer has grown. Animosity, which affects Chinese consumers' purchases, has also become very important.

To implement our method, we first investigated the impact of the aggregated animosity during THAAD deployment on the purchase of Korean products. Next, we divided animosity into three groups: political, economic, and cultural animosity; this categorization was used in modified animosity models (Kalliny and Lemaster, 2005; Ma, Wang and Hao, 2012). We collected news editorials displaying the three types of animosity separately and examined their impact on Korean product purchase.

The remainder of this paper is organized as follows. First, the theoretical background and literature regarding the animosity model are reviewed and explained. Next, we present the hypotheses regarding our proposed animosity model. The methodology, including data collection, sentiment analysis, and statistical models, are presented in the following section. The next section discusses the analysis results and main contributions of this paper. In the final section, we present our concluding remarks.

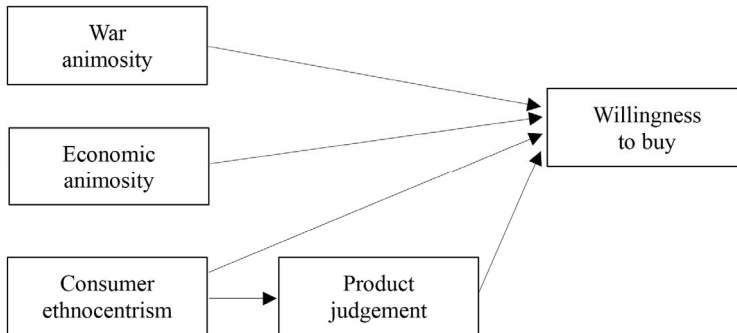
## 2. Theoretical Background and Literature Review

### 2.1. Animosity Model Approach

Klein, Ettenson and Morris (1998) claimed that country-specific animosity was another important element in foreign product purchase intention. They proposed an animosity model comprising two types of animosity (war and economic animosity) and consumer ethnocentrism. War animosity is caused by military conflict between two countries. Economic animosity refers to the feelings for an economically-dominant country since it has an

excessive impact on many domestic industries. Fig. 1 illustrates the basic framework of the animosity model. Klein, Ettenson and Morris (1998) showed that country-specific animosity directly influences consumer willingness to buy foreign products. On the other hand, consumer ethnocentrism has a direct or indirect impact on foreign products purchase based on product judgement.

**Fig. 1.** The Original Animosity Model



Kalliny and Lemaster (2005) extended the animosity model by adding cultural and religious animosity to the original animosity model (Klein, Ettenson and Morris, 1998). They proposed that cultural and religious animosity affects consumers' foreign product purchases. Their model proposed that war, economic, cultural, and religious animosity affects firm entry mode. Lee Je-Hong (2018) found evidence of Chinese consumers' animosity toward Koreans and Korean products after deploying THAAD. Xie (2018) also find that cultural affinity, measured by mandarin test (HSK), has influence of promoting trade.

A common methodological feature of animosity model literature is that the survey-based method was used exclusively to measure animosity. As mentioned in the introduction section, besides animosity-model-based literature, many studies have focused on the impact of political conflict on trade and measure conflict or animosity using versatile methods other than the survey approach.

## 2.2. Political-Conflict-Focused Approach

Heilmann (2016) analyzed several cases of political conflict between nations. In particular, he used the DID model to measure the boycott period of four countries. He stated that the reduction in bilateral trade was followed by several boycotts: the boycott of Danish goods in Muslim countries during the Muhammad Comic Crisis in 2005–2006, U.S. boycott of French goods over the Iraq war in 2003, China's boycott of Japanese goods during the Diaoyu/Senkaku Island conflict in 2012, and Israel's boycott of Turkish products during Gaza conflict in 2014.

Wan, Lian and Chen (2019) also employed the DID method to measure the effect of THAAD deployment on imported Korean goods in China. They found that Chinese imports from Korea declined by 15% after February 2017. Based on these findings, Wan, Lian and Chen (2019) argued that the government could use political relations to influence the

economic position of trading partners. Shen and Kwak Ro-sung (2019) also examined economic effects of the Korean Wave and THAAD by questionnaire.

Meanwhile, some papers use newspaper to measure the conflict. Pandya and Venkatesan (2016) focused on the political conflict between the US and France. When France and the US had a dispute over the Iraq war, US consumers reduced their purchase of French-style branded products in US supermarkets. Pandya and Venkatesan (2016) measure the animosity towards France each week by counting the number of Fox News programs that reported regarding the US-France conflict. Du et al. (2017) measured China's political relations with nine major countries by Chinese newspapers and estimated their effect on trade. They employed a political relation index based on reports of bilateral political events obtained from Chinese newspapers, assigning weights ranging from -9 to 9 to events based on their severity.

### 2.3. Animosity and News Articles

Earlier, we reviewed two strands of literature analyzing the consumer response on the occurrence of international conflict or consumer animosity occurred. Unlike the animosity model approach, the studies using the political-conflict-focused approach did not consider consumers' animosity. They only focused on whether a change occurred in the consumption of imported goods from the country in conflict before and after an event (most of them are political conflicts). However, the consumers' animosity might implicitly be involved in their process from the event occurrence to the trade amount change. Therefore, we consider the political-conflict-focused studies to be of similar kind with the animosity model approach cases in this paper. Some important empirical studies of the animosity model and political conflict approach are summarized in Table 1.

As presented in Table 1, numerous studies analyzed the conflict or animosity using the survey or DID method. However, recent studies have utilized the newspapers to measure the degree of conflict (Du et al., 2017; Pandya and Venkatesan, 2016). Public opinions about issues with other countries can be formed through the country's own newspapers. Consumers may be influenced by the newspaper content and thus reduce their consumption of imported goods from the countries in conflict. Therefore, it can be used as a new tool for measuring and analyzing the effect of national conflicts on consumption declines. In many areas other than the consumer animosity or political conflict, the newspapers have been used in explaining consumer behaviors. Apart from only counting the positive and negative news, studies analyzing the sentiment of news are increasing. For example, Doms and Morin (2004) examined whether the tone and volume of economic words in the news affect consumers. Uhl (2011) found that news sentiment explains changes in private consumption.

Meanwhile, overseas channels such as Google, YouTube, and Facebook are blocked in China. Therefore, various media sources of information are not able to influence consumers' purchasing intentions. Chinese news editorials become the main medium of information communication between the Chinese government and consumers, which can form public opinion. The Chinese government can unilaterally deliver the state's position regarding various issues to consumers through newspaper media. With other sources blocked, consumers are likely to trust the information obtained from news media and eventually agree with the newspaper's opinion. As a result, news editorials can generate consumer animosity. The increased animosity may drive consumers to reduce consumption of goods from the adversarial country.

**Table 1.** Animosity and Political Conflict Related Literature

Author	Home Country	Foreign Country	Animosity/Conflict Background	Animosity/Conflict Analysis Tool	Consumer Response Types
Klein, Ettenson and Morris (1998)	China	Japan	Occupation, Massacre, Unfair trading practices	Survey for 244 people	Willingness to buy Japanese products compared to domestic products
Shoham et al. (2006)	Jewish Israelis	Arab Israelis	Armed dispute Second Intifada	Survey for 135 people	Willingness to buy Arab-Israeli products and service
Lee Je-Hong (2018)	China	Korea	THAAD deployment in Korea	Survey for 357 people	Korean national image and satisfaction of Korean products
Heilmann (2016)	Muslim countries, China, U.S.A., Turkey	Denmark, Japan, France, Israel	Muhammad cartoon crisis, Senkaku/Diaoyu island conflict, US boycott of France, Turkey's boycott of Israel	DID method when each event occurred	Imports from boycotted country
Pandya and Venkatesan (2016)	USA	France	US boycott of France for Iraq war	The number of Fox News Programs reported regarding the conflict.	Supermarket products that consumer deemed to French brand
Du et al. (2017)	China	9 countries (U.S.A., Japan, Russia etc.)	-	Political relation index from Chinese newspapers according to severity.	Exports to China from partner country
Wan, Lian and Chen (2019)	China	Korea	Thaad deployment in Korea	DID method at July 2016(official announcement of THAAD deployment) and Feb. 2017 (approval of the land exchange for the deployment)	Exports to China from partner country
Shen and Kwak Ro-Sung (2019)	China	Korea	THAAD deployment in Korea and Korean wave	Survey for 302 people	Product attitude, Product attachment

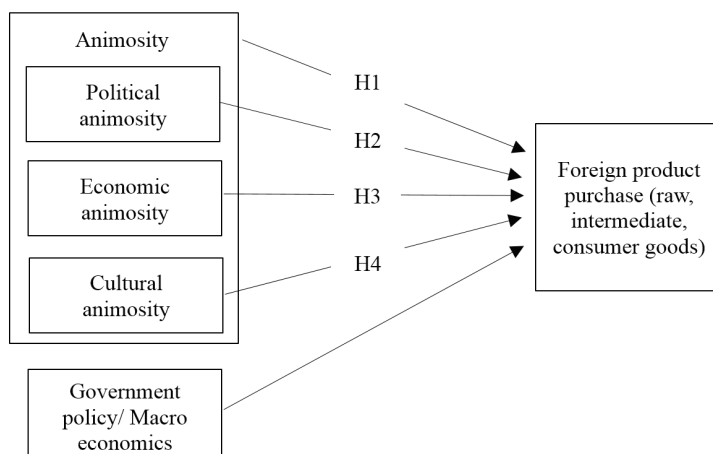
### 3. Hypotheses Development

#### 3.1. Proposed Model

Our theoretical model is illustrated in Fig. 2. We expanded the base model of the previous study (Kalliny and Lemaster, 2005). In the proposed model, we first examined the effect of

aggregated animosity on foreign product purchase. Next, we categorized animosity into three groups: political animosity, economic animosity, and cultural animosity, and examined them separately. Political animosity is superordinate to war animosity and concerns political issues from military events to free trade agreements. Economic animosity has the same concept as the base model, i.e. negative feelings towards an economically-dominant country or multinational corporation. Cultural animosity also follows the main model, i.e. animosity towards celebrities, game, or TV program.

**Fig. 2.** Proposed Conceptual Framework on Animosity of Present Study



### 3.2. Hypotheses Construction

Based on the proposed model framework in Fig. 2, we first tested whether Chinese aggregated animosity affects the purchase of Korean products (H1). Interestingly, in previous studies, only consumer goods and highly branded products were damaged by the animosity, while intermediates or raw materials were not affected (Heilmann, 2016; Li and Liu, 2017). Based on these findings, we derived three sub-hypotheses corresponding to consumer goods (H1a), intermediates (H1b), and raw materials (H1c) as follows. Table 2 presents the variable definitions and its literature background.

*H1: The animosity towards South Korea in Chinese news editorials affects China's import of Korean goods.*

*H1(a/b/c): The animosity towards South Korea in Chinese news editorials affects China's import of Korean (consumer goods/intermediates/raw materials).*

We categorized news editorials along three dimensions: political animosity, economic animosity, and cultural animosity based on the extended animosity models. Although some research focused on political conflicts only, in this study, we broadened the scope due to the availability of news editorials that covered many topics. Thus, following the similar contexts of H1, we derived sub hypotheses H2, H2a, H2b, and H2c, which corresponds to the impact of political animosity on consumer goods, intermediates, and raw materials, respectively. The detailed hypotheses are listed as follows.

*H2: The political animosity towards South Korea in Chinese news editorials affects China's import of Korean products.*

*H2(a/b/c): The political animosity towards South Korea in Chinese news editorials affects China's import of Korean (consumer goods/intermediates/raw materials).*

We tested the effects of economic and cultural animosity on the Chinese import of South Korean products using hypotheses H3 and H4, respectively. We generated their respective sub-hypotheses concerning consumer goods, intermediates, and raw materials by adding the indices a, b, and c, respectively, as follows.

*H3: The economic animosity towards South Korea in Chinese news editorials affects China's import of South Korean products.*

*H3(a/b/c): The economic animosity towards South Korea in Chinese news editorials affects China's import of South Korean (consumer goods/intermediates/raw materials).*

*H4: The cultural animosity towards South Korea in Chinese news editorials affects China's import of South Korean products.*

*H4(a/b/c): The cultural animosity towards South Korea in Chinese news editorials affects China's import of South Korean (consumer goods/intermediates/raw materials).*

Table 2 summarizes the existing research sources for each independent and dependent variable in the present paper; the operational definitions of the variables are also given. For the dependent variables, many studies have set product consumption of partner countries as a dependent variable (Du et al., 2017; Heilmann, 2016; Wan, Lian and Chen, 2019). Moreover, following some studies that have analyzed consumer and corporate consumption by dividing products into consumer goods, intermediate goods, and raw materials (Heilmann, 2016; Li and Liu, 2017), we include the type of goods. The SOK index is derived from sentiment analysis; thus, the basic method is the same as the sentiment analysis (Uhl, 2011; Wei et al., 2017). Furthermore, in many studies, animosity was analyzed by the impact of political, economic, and cultural divisions on consumption (Kalliny and Lemaster, 2005; Shen and Kwak Ro-Sung, 2019). By referring to other studies (Du et al., 2017; Uhl, 2011; Wan, Lian and Chen, 2019), we set the control variable as those that could affect exports to China.

**Table 2.** Variables and Related Literature

	Content	Definition	Source
Dependent variables	Chinese import from Korea	Chinese purchase of Korean products	Du et al., 2017; Heilmann, 2016; Wan, Lian and Chen, 2019
	Consumer Goods import from Korea	Chinese purchase of Korean consumer goods	Heilmann, 2016; Li and Liu, 2017; Pandya and Venkatesan, 2016
	Intermediates import from Korea	Chinese enterprises' purchase of Korean intermediates	Heilmann, 2016; Li and Liu, 2017
	Raw Materials import from Korea	Chinese enterprises' purchase of Korean raw materials	Heilmann, 2016; Li and Liu, 2017

**Table 2.** (Continued)

	Content	Definition	Source
Independent Variables	SOK Index	SOK Index represents international events and its interpretation from media	Uhl, 2011; Wei et al., 2017
	Political SOK Index	Political SOK Index represents the event of international relation and its interpretation from media	Heilmann, 2016; Kalliny and Lemaster, 2005; Pandya and Venkatesan, 2016; Shen and Kwak Ro-Sung, 2019
	Economic SOK Index	Economic SOK Index represents the event of Korean enterprises and its interpretation from media	Kalliny and Lemaster, 2005; Shen and Kwak Ro-Sung, 2019
	Cultural SOK Index	Cultural SOK Index represents the event of Korean entertainment and its interpretation from media	Kalliny and Lemaster, 2005; Shen and Kwak Ro-Sung, 2019
	Policy (After Mar.2017 is 1, otherwise 0)	After Feb. 2017 , approval of the land exchange for the deployment(its effect to import from Korea was proved by Wan, Lian and Chen (2019)) , Control variable	Lian and Chen, Wan, 2019
	China's Import Growth	Control variable	Du et al., 2017
	Chinese CPI	Control variable	Uhl, 2011

## 4. Data and Empirical Specification

### 4.1. Sentiment Analysis

In recent years, people are increasingly generating and consuming enormous amounts of textual data via the internet (Zhang et al., 2018). Thus, we can gain valuable information by mining textual data. Text mining is the process of deriving patterns and trends from text. One of the analytical methods of text mining is emotional analysis, which measures how good and bad the sentiments of text are.

Research regarding sentiment analysis conducted in English has already evolved significantly, whereas sentiment analysis in the Chinese context is still developing (Lee and Renganathan, 2011; Lizhen et al., 2014; Zhang, Xu and Wan, 2012). The Chinese language has characteristics that differ from those of the English language. One of the features of the Chinese language is the lack of spacing between words. Additionally, Chinese characters often comprise a combination of one or more Chinese characters (Peng, Cambria and Hussain, 2017). Thus, the first step would be segmentation of phrases.

For word segmentation, three of the most popular Chinese word tokenisation programmes available are ICTCLAS, THULAC, and Jieba segmentor. ICTCLAS was invented by Dr. Zhang Huaping (Zhang et al., 2003) and provides application programming interfaces (APIs)



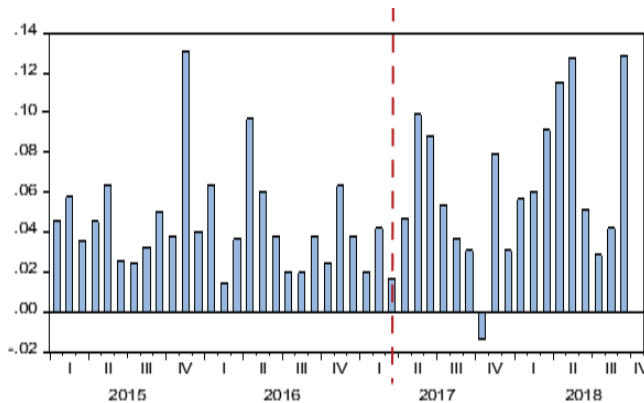
in C++, Java, Python, etc. Meanwhile, THULAC (Li and Sun, 2009) was developed at Tsinghua University and supports C++, Java, and Python. Lastly, Jieba1 is an open-source Chinese text segmentor. It is easy to access because it supports nine programming languages (Peng, Cambria and Hussain, 2017). Hence, we used Jieba for this analysis. The next step was sentiment classification. The input words were classified as ‘positive’, ‘negative’, or ‘neutral’.

#### 4.2. Data Collection

For data collection, we considered the period from January 2015 to September 2018 to cover the period before and after the deployment of THAAD in South Korea. The sentiment of Chinese newspapers towards South Korea varied from time to time and consumer response may have changed accordingly. To capture the regression relationship between these variables, we utilized the monthly-aggregated news editorial information regarding South Korea. The dynamics of monthly sentiment scores are shown in Fig. 3, and the main event timeline is summarized in Table 3.

Fig. 3 shows the monthly changes of sentiment in Chinese news editorials about South Korea January 2015 to September 2018. The sentiment index from Chinese newspapers ranged from  $-0.01$  to  $0.13$ , approximately. As Fig. 3 indicates, the sentiment index was low in June and July 2015 due to the Middle East Respiratory Syndrome (MERS), also known as camel flu. The index surged to about  $0.13$  in November 2015 when the Chinese prime minister, Li Keqiang, visited South Korea. Then, the sentiment index plummeted due to the announcement of the THAAD deployment in February 2017. The Chinese government changed its position when the Lotte Group provided land to the South Korean government to deploy the THAAD missile system in February 2017. Subsequently, a total of 87 Lotte supermarkets in China were shut down by Chinese authorities. Thus, the sentiment index fell sharply in the following month (March 2017).

**Fig. 3.** Sentiment on Korea (SOK)



**Note:** The red dash line denotes the time when Chinese opinion has deteriorated (March 2017).

**Source:** Authors' reconfiguration and modification using Chinese news (2015-2018).

In May 2017, the Go match between Lee Sedol and AI AlphaGo drew significant interest from the Chinese people. In June 2017, many articles were written promoting harmony with neighboring countries to increase enthusiasm for China's 'One Belt, One Road' project. In

October–November 2017, China authorities allowed group tours to Seoul in Shandong, Beijing; consequently, the sentiment index increased.

Diplomatic relations between South Korea and China changed remarkably in 2015–2018; the main factor that affected this relationship was the South Korean government's decision to deploy the US THAAD system. After the THAAD deployment in Seongju, the North Kyungang Province, the tension between South Korea and China escalated. In particular, Lotte Group became the target of direct retaliation since it had provided the Seongju site for the THAAD deployment. Lotte supermarkets in China could not withstand this situation and eventually closed its business in China. Moreover, at that time, the South Korean retail industry in China had suffered a slump.

**Table 3.** News Timelines about South Korea

Date	Event
2015.3.21.	South Korea–China–Japan Summit Meeting in Seoul, Korea
2015.3.27	South Korea joined AIIB
2015.6–7	MERS spread in South Korea.
2015.9	President Park Geun-hye visited China
2015.11	China prime minister Li Ke Qiang visited South Korea
2015.12.20	The Korea–China FTA was executed
2016.2.7	South Korea announced its decision on THAAD deployment
2016.9.30.	Korean Ministry of National Defense announced the THAAD deployment in Seong-Ju, North Gyeongsang Province, Korea
2016.10	Samsung Electronics found fault in cell phone battery
2017.3.1.	87 Lotte mart supermarkets have been closed by authorities in China
2017.3.6.	Equipment part for THAAD arrived in the Osan Air Base
2017.3.15	China authorities banned group tours to Korea
2017.5	Go match between Se-dol Lee and A.I. AlphaGo
2017.10.31.	An extension of the maturity of the currency swap. First-ever agreement between the two governments after the THAAD conflict.
	South Korea and China announced the results of discussions on closer bilateral relations
2017.11.28.	China authorities allowed group tours to Seoul in Shandong, Beijing (except Lotte Hotel, Duty Free Shop)
2017.12.14.	South Korea–China Summit Meeting, discussion about the THAAD Resolution
2018.4.26.	Lotte Mart sold 21 Beijing stores to Chinese companies

**Source:** People's Daily (2015-2018).

### 4.3. Variable measurement

This sub-section presents the data and variables and explains the sentiment index in further detail. The data and summary statistics are exhibited in Table 4.

**Table 4.** Data and Summary Statistics

	Variable	Period	Source	Mean	Max	Min	Std. Dev.
Dependent variables	Chinese import from Korea	2015.1–2018.9	Korea International Trade Association	0.0273	0.2626	−0.2426	0.1375
	Consumer Goods import from Korea	2015.1–2018.9	Korea International Trade Association	0.0018	0.5189	−0.7190	0.3088
	Intermediates import from Korea	2015.1–2018.9	Korea International Trade Association	0.0433	0.3194	−0.2137	0.1560
	Raw Materials import from Korea	2015.1–2018.9	Korea International Trade Association	−0.0068	1.0090	−0.8984	0.4404
Independent Variables	SOK Index	2015.1–2018.9	Website of People’s Daily	0.0519	0.1307	−0.0133	0.0324
	Policy (After Mar.2017 is 1, otherwise 0)	2015.1–2018.9	News articles	0.4222	1	0	0.4995
	China’s Import Growth	2015.1–2018.9	China National Bureau of Statistics	0.0326	0.3870	−0.2060	0.1637
	Chinese CPI	2015.1–2018.9	The Bank of Korea	101.7696	102.9	100.8	0.4633

#### 4.3.1. Dependent Variable

The growth rate of Korean export to China, calculated as the difference between the log-transformed value of Chinese import from South Korea in the current month and that of the same month last year’s, was employed as a dependent variable. Export data was obtained from the Korea International Trade Association, and only included data regarding manufactured goods that passed through the customs office. These data were analyzed after categorizing them into consumer goods, intermediates, and raw materials, in the processing stage. The effect of public opinion on trade is instant and only lasted for a short period and disappeared within two months (Du et al., 2017). Thus, we ignored the time lag between the dependent and independent variables.

#### 4.3.2. Independent Variable

The sentiment index, the main independent variable, was created using Chinese newspaper editorials. We follow the approach in Uhl (2011) to construct monthly sentiment indices for 3 different type of news categories. We searched for the news related to South Korea on the People’s Daily website in China. The People’s Daily is one of the most influential newspapers in China, and its website provides other newspaper articles as well. Among the news articles about South Korea, we collected news editorials for the period January 2015 to September 2018. News articles were aimed at reporting facts about events, whereas news editorials were section for writers’ or authors’ opinion, often the government’s opinions, which provide a clearer picture of their affinity or feelings towards South Korea. Analyzing the sentiment

towards South Korea, a total of 599 news editorials were collected from Chinese newspapers.

The National Taiwan University Sentimental Dictionary (NTUSD) was used to classify positive and negative words. It provides 11,088 sentiment words, containing 2,812 positive and 8,276 negative words. The NTUSD was published in 2006 and is widely used by researchers in Chinese language sentiment analysis. One of the widely used methods of computing the sentiment score is as follows (Peng, Cambria and Hussain, 2017; Wang and Ku, 2016):

$$SentimentScore(d) = \frac{N(Positive\ terms(d)) - N(Negative\ terms(d))}{N(Positive\ terms(d)) + N(Neutral\ terms(d)) + N(Negative\ terms(d))} \quad (1)$$

Here,  $N(Positive\ term(d))$ ,  $N(Negative\ term(d))$ , and  $N(Neutral\ term(d))$  represent the number of positive, negative, and neutral words, respectively, in one document. 'Sentiment Score(d)' refers to the sentiment score of one document 'd', i.e. one news editorial, and ranges between -1 and 1.

In this study, instead of computing the sentiment score for one news editorial, we calculated the sentiment score for the monthly-aggregated news editorials. We aggregated all the news editorials about South Korea for a month and then calculated the sentiment score for the monthly-aggregated news editorials. At first, we attempted to sum all the sentiment scores of individual news editorials for a month but these scores tended to be overestimated. In contrast, our suggested method attenuated the problem. Thus, we utilised our modified monthly based sentiment score, i.e. SOK, which is given by

$$SOKIndex = \frac{N(Positive\ terms(m)) - N(Negative\ terms(m))}{N(Total\ terms(m))} \quad (2)$$

$N(Positive\ terms(m))$  and  $N(Negative\ terms(m))$  are the numbers of positive and negative terms, respectively, of all aggregated news editorials for a month. The number of total words in the monthly-aggregated news editorials is denoted as  $N(Total\ terms(m))$ .

According to literature, there are four different types of animosity: War animosity, economic animosity, cultural animosity, and religious animosity (Kalliny and Lemaster, 2005). Therefore, we divided the news editorials according to their type of animosity and estimated the sentiment index using the news editorials belonging to each animosity. Among the four animosity types, religious animosity did not appear and was hardly defined in any South-Korea-related article, so only the remaining three types of animosity were analyzed as shown in Fig. 2. The news articles regarding the diplomatic relations between countries were classified as war animosity (or political animosity), the articles regarding Korean companies or business topics were classified as economic animosity, and the articles on culture, such as K-pop or the Go match of AlphaGo versus Lee Sedol, were classified as cultural animosity. The SOK index in Equation (2) was calculated separately for each different animosity.

To analyse the effect of the sentiment index more precisely, we added some control variables. Firstly, the deterioration of the growth of Chinese imports from Korea intensified in February 2017, when China adopted stronger policies resulting in the shutdown of Lotte supermarkets in China. To control for government policies since then, we added a dummy variable. Besides this variable, we also included some important macroeconomic variables, such as the lag term of the dependent variable, which represents the growth of Chinese imports from Korea, the Chinese import growth rate, and the consumer price index (CPI), to control the macroeconomic conditions of the Chinese market.

#### 4.4. Model

Public opinion could affect consumers’ consumption. Thus, the sentiment of news editorials could be a mediator influencing China’s import of South Korean consumer goods. To measure these effects, we built a model as shown in Equation (3):

$$\begin{aligned} \text{Chinese import from Korea}_{g,t} &= \beta_0 + \beta_1 \text{SOK Index}_{a,t} + \beta_2 \text{Chinese import from Korea}_{g,t-1} + \\ &\beta_3 \text{Chinese import growth}_t + \beta_4 \text{Policy}_t + \beta_5 \text{Chinese CPI}_t + \varepsilon_t \end{aligned} \quad (3)$$

where Chinese import from Korea<sub>g,t</sub> refers to the growth rate of China’s import of a good ‘g’ from Korea for the month ‘t’. SOK Index<sub>a,t</sub> is the sentiment score regarding Korea with animosity ‘a’ for the month ‘t’. Policy<sub>t</sub> is a dummy variable, which is 1 for after March 2017, and 0, otherwise. Chinese import growth<sub>t</sub> refers to the global Chinese import growth, representing China’s import demand, and Chinese CPI<sub>t</sub> is the CPI of China.

The expected signs of the independent variables are summarized in Table 3. The SOK index and the Chinese import growth rate were expected to have positive relations with the rate of Korean exports to China. The policy variable was expected to have a negative relation with rate of Korean exports to China. The Chinese CPI was expected to have either a negative or positive relation with the rate of Korean exports to China based on the strength of the demand or supply effect.

**Table 5.** Expected Sign of Independent Variables

	Variables	Expected sign
Independent variables	SOK index	+
	Policy	-
	Chinese import growth	+
	China CPI	-,+

Prior to the empirical data analysis, the correlations between independent variables were examined, and the results are reported in Table 6. We calculated the correlations between each SOK replacement and other continuous covariates because the SOK index will be replaced with “Political SOK,” “Economic SOK,” and “Cultural SOK” according to the types of animosity in the further study. Furthermore, to check for the multicollinearity problem, we computed the VIFs for each case and added them at the bottom of the table. The correlation matrix and VIF outcomes are reported in Table 6. As shown in Table 6, multicollinearity concerns seem to be negligible because all the recorded VIF values were much less than 10, which is a usual cut-off point of multicollinearity.

**Table 6.** Correlation Matrix and VIF

	SOK Index	Political SOK	Economic SOK	Cultural SOK	Chinese import growth
Chinese import growth	0.1537	0.0312	0.0010	0.4886***	
Chinese CPI	0.0934	-0.0001	-0.0998	0.2520	0.0590
VIF	1.02	1.03	1.01	1.28	1.00

## 5. Analysis Results

### 5.1. Baseline model results

Table 7 summarizes our baseline model results related to hypotheses H1, H1a, H1b, and H1c. Table 7 shows that the coefficient estimates of the SOK index were only significant for Korean consumer goods imports with positive relationships (H1a). The second column demonstrates that as one unit of SOK increased, the growth of consumer goods import increased by 2.59%. In contrast, the coefficient of the SOK index for other goods, such as intermediates and raw materials, were not significant. This means that Chinese newspapers' sentiment regarding South Korea only led the Chinese consumers to stop purchasing consumer goods. People are easily exposed to imported consumer goods and hence, could directly respond to them.

In contrast, both hypotheses H1b and H1c, related to intermediate goods and raw materials, respectively, were not supported because the SOK index was not significant. Chinese news articles about South Korea did not influence the import of intermediates and raw materials. This implies that news articles cause consumer boycotts but not enterprise boycotts. The test results for H1 was not supported either. Intermediate products accounted for about 80% of the total South Korean exports to China, which may have caused ineffective outcomes for the total Chinese imports from Korea, regardless of Chinese consumers' boycott.

The signs of control variables were as expected, when they were significant. Chinese import growth was positively related to the total exports and intermediates cases. The Chinese government's authority had significant role in decreasing the import of Korean consumer goods. The Chinese CPI was negatively related to consumer goods imported from Korea.

**Table 7.** Baseline Model of the Effects of South Korean Exports to China

Variables	Total (H1)	Consumer goods (H1a)	Intermediates (H1b)	Raw materials (H1c)
SOK	0.044	2.593**	0.080	-0.526
(Sentiment on Korea)	(0.288)	(1.178)	(0.293)	(2.156)
Import from KOR <sub>(t-1)</sub>	0.497***	0.369**	0.6045***	-0.193
	(0.123)	(0.138)	(0.129)	(0.181)
Chinese import growth	0.376***	-0.205	0.386***	0.422
	(0.132)	(0.564)	(0.130)	(1.022)
Policy	-0.019	-0.644***	-0.0132	0.581*
	(0.046)	(0.182)	(0.049)	(0.329)
Chinese CPI	-0.0412	-0.331**	-0.028	-0.035
	(0.030)	(0.122)	(0.029)	(0.224)
Constant	4.179	33.310**	2.860	3.635
	(2.982)	(12.232)	(2.937)	(22.533)
Time	Yes	Yes	Yes	Yes
Observations	45	45	45	45
R-squared	0.8453	0.5	0.8869	0.1458

**Notes:** \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.001$ .

Thus, only consumer goods were only influenced by the animosity caused by news editorials. Consumers are the ones who read newspapers and are influenced by the articles; therefore, it is natural for Chinese consumers to stop purchasing Korean consumer goods in a conflict situation.

## 5.2. Results for the Different Types of Animositities

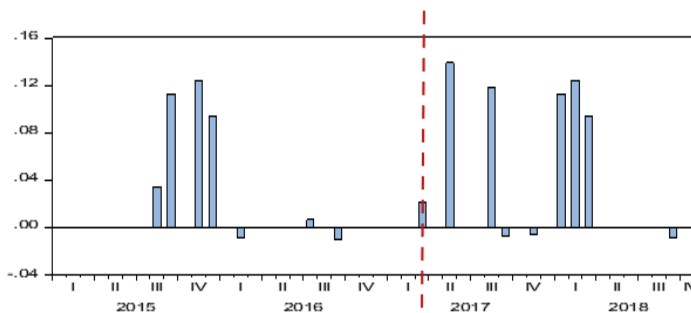
We also analyzed the effect of different types of animosity. We defined the articles covering the diplomatic relations between South Korea and China as ‘political animosity (or war animosity)’, Korean multinational enterprises or their business as ‘economic animosity’, and culture, such as Korean dramas, celebrities, or AlphaGo, as ‘cultural animosity’.

Our data analysis was based on monthly observations; therefore, there were a total of 45-month observations for the time-related model from January 2015 to September 2018. However, some types of news editorials were not observed even once in the monthly aggregation. Thus, news editorials related to political conflict were observed only for 17 months, economic and cultural sentiments were only observed for 31 and 35 months, respectively.

As shown in Fig. 4, some sentiment scores were left blank because no articles related to political animosity were available for some months. Since articles were aggregated on a monthly basis, no articles were available for some months. The sentiment score of political animosity fluctuated heavily. The sentiment scores related to economic animosity were observed more frequently than those related to political animosity, as shown in Fig. 5. This is because many Korean enterprises exist in China and conduct business in many different ways. Despite the negative sentiment scores for some months, most months had positive economic animosity scores for South Korea. Fig. 6 depicts the cultural sentiment towards Korean culture like K-pop, Korean dramas, Go math of AlphaGo, and Lee Sedol. Among the three news types, articles related to cultural sentiments were published most frequently. Although the sentiment score was not very high, it was mostly positive and did not fluctuate as much as other types of news.

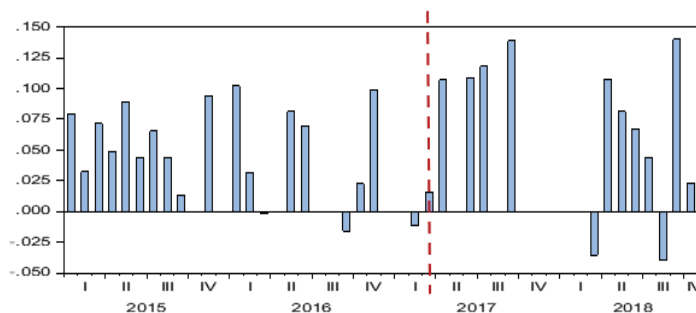
The red dashed line denotes the period when Lotte Group provided land for the THAAD deployment in Korea in February 2017. Subsequently, the Chinese government changed its strategy, implementing stricter rules for South Korea. All the Chinese newspapers also expressed their animosity towards South Korea thereafter. Thus, regardless of the animosity category, the sentiment towards South Korea was low at that time.

**Fig. 4.** Political Animosity SOK



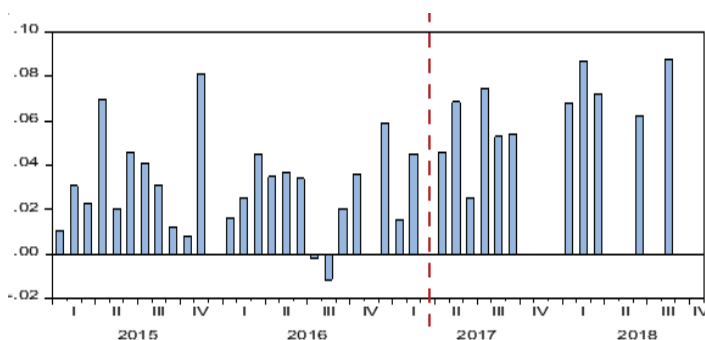
**Note:** The red dash line denotes the time when Chinese opinion has deteriorated (March 2017).

**Source:** Authors' reconfiguration and modification using Chinese news (2015-2018)

**Fig. 5.** Economic Animosity SOK

**Note:** The red dash line denotes the time when Chinese opinion has deteriorated (March 2017).

**Source:** Authors' reconfiguration and modification using Chinese news (2015-2018)

**Fig. 6.** Cultural Animosity SOK

**Note:** The red dash line denotes the time when Chinese opinion has deteriorated (March 2017).

**Source:** Authors' reconfiguration and modification using Chinese news (2015-2018)

The hypotheses based on different types of animosity were examined and the related results are given in Table 8. The results show the heterogeneity of animosity's effect on different product types. The total exports showed no significant correlation with any of the three news types, and thus does not support H2, H3, H4. The reason for these results is similar with the H1 test results. Among the total Korean exports to China, the proportion of the intermediate products was high, so total exports were affected more by intermediate exports. Since news sentiment affects customers more quickly, overall exports have not been affected by any type of news.

The case of Korean consumer goods export revealed that only political conflict had a positive impact, which supports H2a. In contrast, neither economic nor culture sentiment had any impact on consumer goods; thus, H2b and H2c were not supported. We find that political conflict is the most significant factor of the consumer goods trade.

A one unit increase in political conflict's SOK was associated with a 2.26% increase in consumer goods growth rate. Moreover, according to Table 8, economic SOK and cultural SOK had no significant relations with any of the three animosities; thus, H3 (a/b/c) and H4



**Table 8.** Effect of SOK by Animosity on Chinese Import from Korea

Dep. Variables	Total (H2)	Total (H3)	Total (H4)	Consumer goods (H2a)	Consumer goods (H3a)	Consumer Goods (H4a)	Inter-mediates (H2b)	Inter-mediates (H3b)	Inter-mediates (H4b)	Raw materials (H2c)	Raw materials (H3c)	Raw materials (H4c)
Political animosity	-0.042			2.259**			-0.048			0.087		
SOK	(0.252)			(0.957)			(0.365)			(2.010)		
Economic animosity		-0.004			-0.715			0.269			-0.403	
SOK		(0.2440)			(0.836)			(0.239)			(2.111)	
Cultural animosity			0.106			3.204			-0.0969			-0.515
SOK			(0.503)			(2.133)			(0.445)			(3.865)
Import from KOR (t-1)	-0.202	0.488***	0.570***	-0.011	0.383**	-0.0323	0.294	0.574***	0.631***	-0.590	-0.255	-0.102
	(0.221)	(0.15)	(0.124)	(0.174)	(0.169)	(0.189)	(0.349)	(0.175)	(0.121)	(0.335)	(0.251)	(0.208)
Chinese import growth	0.287	0.354*	0.359**	0.868	-0.366	-1.537**	0.369	0.449**	0.413***	-0.939	0.422	0.989
	(0.274)	(0.194)	(0.136)	(1.063)	(0.768)	(0.689)	(0.413)	(0.188)	(0.125)	(2.340)	(1.629)	(1.056)
Policy	0.188*	-0.00228	-0.0148	-1.385***	-0.426*	-0.848***	0.157	-0.0131	0.00308	0.870	0.633	0.660*
	(0.0976)	(0.0641)	(0.0463)	(0.345)	(0.220)	(0.217)	(0.144)	(0.0648)	(0.0440)	(0.715)	(0.530)	(0.363)
Chinese CPI	-0.033	-0.0329	-0.0494	-0.240	-0.159	-0.436***	0.000	-0.0179	-0.0298	-0.123	-0.113	-0.0338
	(0.0547)	(0.0480)	(0.0308)	(0.207)	(0.163)	(0.129)	(0.0786)	(0.0489)	(0.0276)	(0.427)	(0.374)	(0.233)
Constant	3.229	3.349	5.020	24.06	16.02	43.66***	-0.0532	1.829	3.056	12.04	11.63	3.801
	(5.494)	(4.830)	(3.096)	(20.77)	(16.40)	(12.99)	(7.894)	(4.928)	(2.774)	(42.81)	(37.63)	(23.41)
Time	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17	31	35	17	31	35	17	31	35	17	31	35
R-squared	0.886	0.857	0.861	0.726	0.432	0.454	0.853	0.890	0.910	0.456	0.146	0.193

**Note:** \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.001$ .

(a/b/c) were rejected. The result of the intermediates and raw materials are consistent with previous study (Li and Liu, 2017). These results imply that news editorials about political animosity had a negligible impact on enterprises shortly.

The control variables were again as expected when they were significant in the models. For every product type, the lagged last month's export growth had a positive correlation. Chinese import growth was mostly positively correlated with Korean total and intermediates exports to China but negatively correlated with consumer goods. It is not surprising because Korean consumer goods have more substitutes than intermediates. The Chinese government's policy was negatively correlated with consumer goods; however, total exports and raw materials were positively correlated with government policy. This means that Chinese government policy was only focused on consumer goods, not other product types. Furthermore, China's CPI was negatively correlated with consumer goods.

Empirical results show that animosity to partner countries shown in newspapers leads to a decrease in consumer goods purchases. Moreover, among the news, the sentiment of political news had a significant impact on consumer goods. Thus, political animosity is uniquely effective in restricting Chinese consumers' purchase of goods from Korea. This finding is important because of its implication that political conflicts could influence the economic sector. In particular, China has a high consumer power globally due to its large population and a strong political influence over its people. Therefore, small open-economy countries should be cautious if they have a political dispute with China.

## 6. Conclusions and Policy Implications

In this study, we measured consumer animosity by conducting a sentiment analysis of news editorials. In line with the findings of Kalliny and Lemaster (2005) and Uhl (2011), we proposed an animosity model showing that news sentiments have an explanatory power to consumption behaviors in global economy. This approach has numerous advantages and contributes to existing literature in the following aspects.

First, unstructured data formats like texts are more useful for investigating cross-country relations than structured data like numbers. For example, when it comes to analyzing political and cultural relations, textual data may be more informative than numerical data. With the development of text mining techniques, sentiment-based analysis will become more powerful, and this paper may serve as a trigger for the implementation of advanced qualitative techniques in this research field.

Second, we can focus on not only the occurrence of an event but also the diffusion of the event by analyzing the sentiment towards the event in daily newspapers. For example, political relations can continue to improve or deteriorate after the occurrence of a single event. Political relations can fluctuate, and the degree of these fluctuations may vary with time due to some influencers. There was no paper on how political, economic and cultural sectors affect trade dynamically. It was hard to find a proxy to measure politics, economy and culture in daily basis. The sentiment expressed in newspapers provides a good indicator of the dynamics of political relations.

Lastly, we can easily distinguish cross-country relations as political, economic, or cultural ones since news editorials can be simply grouped based on the type of news they convey. Based on these advantages, we could effectively investigate whether or not other realms of sentiment affect foreign product purchase.

News sentiment towards a partner country is often delivered through newspapers, but the question of whether or not people participate in a negative campaign remained unanswered.

In this article, we show that Chinese consumers reduced their purchases of Korean goods when the sentiment towards Korea in the news, especially political conflict-related news, was negative. We analyzed monthly data and found that the influence of newspapers' sentiment regarding country relations on consumption behavior was particularly instantaneous.

To the best of our knowledge, this is the first study to use sentiment analysis to measure people's opinions about a partner country. Text mining was suitable for analyzing official media because newspapers deliver their position and opinions to the public. Thus, text mining can discern the extent of sentiment towards other countries. Additionally, we divided news into three types (politics, economic, and culture) and analyzed their effects on trade. The sentiment towards one country can be generated diversely, so it helps to know which topic affected consumers' responses. We found that political conflict with another country has a unique effect on consumers' responses. Similar to existing literature, we also considered the effects of political conflict on different types of goods (consumer goods, intermediates, and raw materials) and found that only consumer goods were influenced by the news, which indicates that an effective reduction in trade volume is mainly caused by consumer behavior.

The implications of this study can be summarized as follows. The theoretical application is that, through this empirical study, dynamic animosity can be measured using newspaper editorials. For the practical application, companies need to pay more attention to news editorials as they have a profound impact on consumer purchasing intentions in China. In international relations with China, government can observe China's position through the tone of Chinese news editorials.

This study suggests that utilizing text mining in the Chinese language to determine the public's opinion will help foreign enterprises in China to obtain a better understanding of Chinese consumers. Our findings revealed that a relationship exists between politics and trade. Moreover, we found that news media acts as a link between the government and consumers. The development of media may indicate a closer connection between consumer behavior and politics in global economy. Therefore, this paper could provide a model to analyze a country's media and consumer behavior. It is useful for analyzing consumer and government in the context of developing countries lacking accurate data.

Regardless of numerous advantages, this paper leaves room for future research to detect which product among various consumer goods was more influenced by the news sentiment for practitioners' trade strategy. Future research can also expand the analysis by using other mediums such as websites and social networking sites to analyze sentiment toward other countries.

## References

- Cambria, E. (2016), "Affective Computing and Sentiment Analysis", *IEEE Intelligent Systems*, 31(2), 102-107.
- Deng, S., T. Mitsubuchi, K. Shioda, T. Shimada and A. Sakurai (2011 December 12-14), "Combining Technical Analysis with Sentiment Analysis for Stock Price Prediction", Paper Presented in 2011 IEEE 9th International Conference on Dependable, Autonomic and Secure Computing, Sydney, NSW, Australia, 800-807.
- Doms, M. E. and N. J. Morin (2004), *Consumer Sentiment, the Economy, and the News Media* (FRBSF Working Paper, No. 2004-09), San Francisco, CA: Federal Reserve Bank of San Francisco.
- Du, Y., J. Ju, C. D. Ramirez and X. Yao (2017), "Bilateral Trade and Shocks in Political Relations: Evidence from China and Some of Its Major Trading Partners, 1990-2013", *Journal of International Economics*, 108, 211-225.

- Guo, X. F., L. G. Yanyan and W. Zhiqiang (2013), "Multi-Aspect Sentiment Analysis for Chinese Online Social Reviews Based on Topic Modeling and HowNet Lexicon", *Knowledge-Based Systems*, 37, 186-195.
- Heilmann, K. (2016), "Does Political Conflict Hurt Trade? Evidence from Consumer Boycotts", *Journal of International Economics*, 99, 179-191.
- Jung, K., S. H. Ang, S. M. Leong, S. J. Tan, C. Pornpitakpan and A.K. Kau (2002), "A Typology of Animosity and its Cross-National Validation", *Journal of Cross-Cultural Psychology*, 33(6), 525-539.
- Kalliny, M., A. Hausman, A. Saran and D. Ismael, (2017), "The Cultural and Religious Animosity Model: Evidence from the United States", *Journal of Consumer Marketing*, 34(2), 169-179.
- Kalliny, M. and J. Lemaster (2005), "Before You Go, You Should Know: The Impact of War, Economic, Cultural and Religious Animosity on Entry Modes", *Marketing Management Journal*, 15(2), 18-28.
- Kalyani, J., P. Bharathi and P. Jyothi (2016), "Stock Trend Prediction Using News Sentiment Analysis", *International Journal of Computer Science & Information Technology (IJCSIT)*, 8(3), 67-76.
- Klein, J. G., R. Ettenson and M. D. Morris (1998), "The Animosity Model of Foreign Product Purchase: An Empirical Test in the People's Republic of China", *Journal of marketing*, 62(1), 89-100.
- Lee, Je-Hong (2018), "Analysis of Impact of Export Competitiveness and Change of National Image Due to Diplomatic Disputes: Focusing on the THAAD Dispute between Korea and China", *Journal of International Trade & Commerce*, 14(4), 273-289. <http://dx.doi.org/10.16980/jitc.14.4.201808.273>
- Lee, H. Y. and H. Renganathan (2011 November 13), "Chinese Sentiment Analysis Using Maximum Entropy", In Proceedings of the Workshop on Sentiment Analysis where AI Meets Psychology (SAAIP 2011), Chiang Mai, Thailand, 89-93.
- Li, X. and A. Y. Liu (2017), "Business as Usual? Economic Responses to Political Tensions Between China and Japan", *International Relations of the Asia-Pacific*, 19(2), 213-236.
- Li, Z. and M. Sun (2009), "Punctuation as Implicit Annotations for Chinese Word Segmentation", *Computational Linguistics*, 35(4), 505-512.
- Lizhen, L., S. Wei, W. Hanshi, L. Chuchu and L. Jingli (2014), "A Novel Feature-Based Method for Sentiment Analysis of Chinese Product Reviews", *China Communications*, 11(3), 154-164.
- Luo, Z. and Y. Zhou (2020), "Decomposing the Effects of Consumer Boycotts: Evidence from the Anti-Japanese Demonstration in China", *Empirical Economics*, 58, 2615-2634.
- Ma, J., S. Wang and W. Hao (2012), "Does Cultural Similarity Matter? Extending the Animosity Model from a New Perspective", *Journal of Consumer Marketing*, 29(5), 319-332.
- McCluskey, J. J. and J. F. Swinnen (2004), "Political Economy of the Media and Consumer Perceptions of Biotechnology", *American Journal of Agricultural Economics*, 86(5), 1230-1237.
- Pandya, S. S. and R. Venkatesan (2016), "French Roast: Consumer Response to International Conflict—Evidence from Supermarket Scanner Data", *Review of Economics and Statistics*, 98(1), 42-56.
- Peng, H., E. Cambria and A. Hussain (2017), "A Review of Sentiment Analysis Research in Chinese Language", *Cognitive Computation*, 9(4), 423-435.
- Schumaker, R. P. and H. Chen (2009), "Textual Analysis of Stock Market Prediction Using Breaking Financial News: The AZFin text system", *ACM Transactions on Information Systems (TOIS)*, 27(2), 1-19.
- Shen, Y. and Ro-Sung Kwak (2019). "Country Image and Product Attitude: An Estimation of Switching Costs for the Korean Wave", *Journal of Korea Trade*, 23(8), 45-72.
- Shoham, A., M. Davidow, J. G. Klein and A. Ruvio (2006), "Animosity on the Home Front: The Intifada in Israel and its Impact on Consumer Behavior", *Journal of International Marketing*, 14(3), 92-114.
- Uhl, M. W. (2011), "Explaining US Consumer Behavior with News Sentiment", *ACM Transactions on Management Information Systems (TMIS)*, 2(2), 1-18.
- Wan, S., Z. Lian and Y. Chen (2019), "Trade Effects of Political Conflicts", *Applied Economics Letters*, 27(11), 925-929.
- Wang, S. M. and L. W. Ku (2016, May 23-28), "ANTUSD: A Large Chinese Sentiment Dictionary", In

*Proceedings of the Tenth International Conference on Language Resources and Evaluation (LREC 2016)*, Portorož, Slovenia, 2697-2702.

- Wei, H. and C. Zhao (2015), "The Structure of China's Imports: A New Framework", *China & World Economy*, 23(5), 85-103.
- Wei, Y. C., Y. C. Lu, J. N. Chen and Y. J. Hsu (2017), "Informativeness of the Market News Sentiment in the Taiwan Stock Market", *The North American Journal of Economics and Finance*, 39, 158-181.
- Xie, M. (2018), "Can Cultural Affinity Promote Trade? HSK Test Data from the Belt and Road Countries", *China & World Economy*, 26(3), 109-126.
- Zhang, H. P., H. K. Yu, D. Y. Xiong and Q. Liu (2003, July 11-12), "HHMM-Based Chinese Lexical Analyzer ICTCLAS", Second SIGHAN workshop on Chinese Language Processing, Sapporo, Japan, 184-187.
- Zhang, S., Z. Wei, Y. Wang and T. Liao (2018), "Sentiment Analysis of Chinese Micro-Blog Text Based on Extended Sentiment Dictionary", *Future Generation Computer Systems*, 81, 395-403.
- Zhang, W., H. Xu and W. Wan (2012), "Weakness Finder: Find Product Weakness from Chinese Reviews by using Aspects Based Sentiment Analysis", *Expert Systems with Applications*, 39(11), 10233-10291.