

## **Adopting big data to create an “outside-in” global perspective of guanxi**

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### **Abstract**

Previous research on the Chinese notion of guanxi has tended to use descriptive approaches to study its prevalence and influence on business and Chinese consumers. Relatively less research has focused on perceptions of guanxi in other parts of the world. This paper addresses this important research gap through adopting an “outside-in” global perspective using big data. In particular, the study draws on 162 million guanxi-related news articles during 2017-2020 extracted from the Global Database of Events, Language and Tone (GDELT), an open-source, real-time current affairs repository of online news and event metadata. The findings reveal that guanxi is heavily influenced by geopolitical and public health issues. The study also discovered a major contrast in the overall tone between China, being slightly positive, and the US and Germany, being largely negative, with the association varying according to changes in the marketing ecosystem.

**Keywords:** business-to-business relationships; big data; ecosystem; GDELT; guanxi; outside-in marketing

## 1. Introduction

Since China opened its market through Deng Xiaoping's economic reforms in 1978, the country has emerged from being one of the world's poorest economies to one of the most influential in terms of political and economic power (Berger & Herstein, 2012). In recent times, China has emerged as one of the world's strongest economies. Its GDP is now comparable with other leading nations of the world, the country has a huge trade surplus of US\$359 billion and a consumer population of 1.4 billion people (The World Bank Group, 2020). Guanxi describes how business is often conducted in China and it has received increasing research attention among scholars (Berger *et al.*, 2018), with the number of articles published since 1970 with the keyword "guanxi" growing from just over 50 to in excess of 21,000. Despite such economic significance and research interest, little research has been undertaken to examine the sentiments surrounding how the world views the emergence of the Chinese economy, and the way business relationships are viewed via the lens of guanxi.

Guanxi is a sentimental and culturally latent construct consisting of *ganqing* (affection), *renqing* (reciprocity) and *xinren* (interpersonal trust), which are commonly used to measure this form of relational exchange in a Chinese context (Lee *et al.*, 2018). Studies surrounding sentiment have been popular in consumer research (Dhaoui *et al.*, 2017), and have been long used for predicting stock market movements (e.g. Baker & Wurgler, 2007; Feuerriegel & Gordon, 2018) as well as election outcomes (e.g. Alvarez *et al.*, 2020). One of the objectives of this study is to provide an operationalization framework with detailed methodology on how to use GDELT to process and transform "unstructured big data" into "structured data". The study intends to analyze guanxi utilizing an outside-in marketing approach to explore how the image of guanxi is interpreted by the insider, i.e., China, in contrast to culturally distant outsiders, i.e., the US and Germany. The study reveals several implications for predicting relational outcomes (guanxi) under different macro market forces or conditions.

Early studies cite the dark side of guanxi (relationships, networks) and debated the subject from an outsider and insider perspective (Gu *et al.*, 2008; Leung & Barnes, 2020). Such examples highlight the challenges faced when operating and navigating international business relationships, and these are exacerbated by the speed of information flow driven by the emergence of the internet and multichannel models. However, most previous studies on guanxi have tended to primarily focus on an “inside-out” perspective, whereas more recently, some scholars have argued that big data can provide researchers with an “outside-in” perspective to help contribute further to our understanding of the phenomenon. Furthermore, from a methodological perspective, big data may also help circumvent selection bias and singular snapshot views of guanxi that are often associated with traditional survey methods (Barnes *et al.*, 2011; Zhang *et al.*, 2020b; Zhang & Watson, 2020).

In this context, Quach *et al.* (2020) introduce the theory of “outside-in marketing” as a practice of listening to the market and leveraging the vast data sources to co-create value through relationship development in order to improve firm performance. The outside-in view draws on a marketing ecosystem framework to scan the environment on five major macro forces, i.e., marketplace, technological landscape, socioeconomic, geopolitical and environmental factors (Zhang & Watson, 2020). In this study, the guanxi phenomenon is investigated using an outside-in marketing approach drawing on big data. The study addresses the Marketing Science Institute’s strategic research goals, which a) call for “approaches to ingesting and analyzing data to drive marketing insights (priority 4),” (Marketing Science Institute, 2018), and b) refine “tools for capturing information to fuel growth (priority 3)” (Marketing Science Institute, 2020).

These calls are addressed through a big data approach using Global Data on Events, Location and Tone (GDELT) to analyze the discourse of guanxi by classifying textual metadata (GDELT, 2020; Leetaru & Schrodte, 2013). Specifically, the study first undertook a

qualitative review of recent guanxi studies from business journals and extracted all the keywords used in the guanxi literature and coded them under the five macro forces in the marketing ecosystem. The key themes that were categorized from the literature were then used to access GDELT and trawl through a total of 685 million online news articles. Eventually, 162 million guanxi-related articles were analyzed to examine global perceptions of guanxi over the period 2017-2020. The study posits China as the “insider” and compares news articles with those of Germany and the US – “outsiders” in terms of their geographic distance, as well as their economic, cultural, geographic, and linguistic differences (Beugelsdijk *et al.*, 2018). Such data enable researchers to explore changes in the perceptions of guanxi from a macro perspective over this time frame.

This study contributes to the guanxi literature in many ways. First, global views of guanxi (Fig. 1) were captured from 162 million online news articles over 44 months of study, constituting an “outside-in marketing” view. The findings provide a structured, systematic, and non-biased account of the state of business relationships (guanxi) with China through the lens of an insider (China) and outsiders (Germany and the US). This in turn allows the transformation of big data from various sources to support decision-making and provides superior advantages over time series or cross-sectional data to reveal inter-country dynamics (Amado *et al.*, 2018; Kauffmann *et al.*, 2020; Liu, 2020). Second, this study provides an operationalization framework (Fig. 2) to use GDELT and machine learning techniques coupled with traditional statistical models to analyze big data (Kauffmann *et al.*, 2020).

< Insert Figure 1 & 2 about here >

Third, the findings from this study are highly relevant for identifying key variables and megatrends influencing the highly sentimental guanxi construct. Obtaining sentiments from insider and outsider perspectives provides fresh insights for scholars to consider new methodological approaches into their research designs (Sheng *et al.*, 2020). Such data may

also provide useful first-mover advantages for practitioners to develop their international business strategies in a bid to leverage performance (Brinch *et al.*, 2021; Kumar *et al.*, 2020).

This paper begins with a review of the current literature on the role of guanxi as an ego-pragmatic strategy to improve business performance in China. Guanxi as viewed from an outside-in marketing ecosystem lens is then discussed in conjunction with big data techniques. The methodology section then explains the big data source and GDELT. The findings relating to the sentiment of guanxi are then presented before the theoretical contributions, managerial implications, limitations, and future research directions.

## **2. Literature review**

### *2.1 Guanxi for navigating business in China*

The concept of guanxi stems from the deeply rooted Confucian philosophy that forms a major part of Chinese culture and that has been practiced since the Confucius period (551-479 BC). Guanxi, when used in a business context, represents a long-term social network where companies exchange favors to achieve benefits (Bian, 2018). Guanxi has been well cited in sociological discourse and was subsequently operationalized as a multidimensional construct via the “GRX” scale, named for ganqing, renqing, and xinren (Yen *et al.*, 2017; Yen *et al.*, 2011). Ganqing (emotional attachment) is the affective aspect of guanxi; renqing (obligational favor), is considered as the instrumental factor of guanxi; and xinren (interpersonal trust) represents trust or credibility (Dobrucali, 2019; Niu *et al.*, 2020; Yen *et al.*, 2011). Guanxi is therefore a complex and multifaceted cultural construct, and it can be classified into three states, including guanxi states, behaviors, and norms (Zhuang *et al.*, 2010). Guanxi is commonly acknowledged by scholars as a way in which business relationships are managed in Chinese culture, a social governance mechanism, or as a Chinese near equivalent of relationship marketing that is well documented in Western discourse (Ambler *et al.*, 1999). In fact, the literature review shows that the number of

articles published since 1970 with the keyword “guanxi” has grown from a mere 52 articles in the 1970s to 21,200 articles in the past decade (see Fig. 3). This demonstrates the significance of guanxi when considering international business relations with China.

< Insert Figure 3 about here >

The ego-pragmatic perspective (Chen *et al.*, 2013) considers guanxi as a strategy to improve firm performance in China. Earlier scholars who studied its effects from an ego-pragmatic perspective discovered that guanxi enhances performance in terms of sales, market growth, return on investment, and asset turnover (Park & Luo, 2001; Peng & Luo, 2000). Guanxi can be used to acquire valuable sources of information and resources due to its ability to leverage on relational ties and personal connections (Bian, 1997; Burt & Burzynska, 2017; Hwang, 1987). From the relational aspect, guanxi is linked to customer loyalty (Lee *et al.*, 2018), can be used to resolve and mitigate conflict (Abosag *et al.*, 2021; Gao *et al.*, 2010; Lu *et al.*, 2021), assist in negotiations (Kumar & Worm, 2003), and reduce the impact of long-term uncertainty (Yen & Abosag, 2016) and opportunism (Abosag *et al.*, 2021; Zhang *et al.*, 2021b). In terms of facilitating business transactions, guanxi has been found to mediate switching intentions (Abosag *et al.*, 2021; Lee *et al.*, 2018), moderate the performance of international joint ventures, strengthen cooperative performance, reduce transaction costs, and improve speed to market (Lu *et al.*, 2021).

Recent studies on guanxi have focused on each dimension of the GRX scale, namely ganqing, renqing and xinren. Other constructs, including mianzi and sijiao, have also been studied (Barnes *et al.*, 2010; Barnes *et al.*, 2015). The study of each dimension has led to similar outcomes. For example, xinren as an antecedent of ganqing has a positive impact on cooperation, financial performance, and inter-firm trust (Berger *et al.*, 2018). Renqing meanwhile is positively related to coordination, satisfaction, financial performance, and long-term orientation (Berger *et al.*, 2018; Yen & Abosag, 2016).

## 2.2. Marketing ecosystem: The outside-in view

Given the importance of guanxi in delivering superior financial performance for firms operating in China, this is the first attempt to study the phenomenon of guanxi from an outside-in marketing perspective. Coined by Day & Moorman (2010), the outside-in marketing approach is defined as: *“The belief in and practice of listening to customers and the market, leveraging data for customer segmentation and profiling, and co-creating value through relationship development with customers and external partners, all of which can be evaluated by customer-oriented measures tied to firm performance”* (Quach *et al.*, 2020, p.108).

The outside-in marketing approach requires constant monitoring of changes in the marketplace. Market sensing and leveraging data are therefore critical elements in the process (Quach *et al.*, 2020). Firms co-create and respond to market trends and intelligence to meet customer needs through active listening and responding to opportunities and threats ahead of competitors (Musarra & Morgan, 2020). This is only possible given the availability of data to stay ahead of the learning curve through data mining techniques to collect user-generated content for monitoring information on a real-time basis (Rust, 2020). It has been argued that this approach can generate superior firm performance compared to inside-out approaches (Musarra & Morgan, 2020; Quach *et al.*, 2020). Zhang and Watson (2020) expanded the outside-in view structurally to incorporate it into a marketing ecosystem framework by defining five major macro forces based on a concentric outside-in view for sustainable advantage. The marketing ecosystem macro factors are: 1) marketplace, 2) technological landscape, 3) socioeconomic, 4) geopolitical, and 5) environmental.

Outside-in thinking can act like a radar and allows organizations to focus on using quantitative data to identify imminent issues to plan and respond to trends. The outside-in view enables the firm to look for trends and data outside the organization to be more

adaptable in the open system. As the *guanxi* construct can be paradoxical (Berger *et al.*, 2018) and evolves with different macro forces over time, using big data can allow practitioners to capture and accurately anticipate market changes. For example, the US-China trade war and the COVID-19 virus (SCMP, 2020; USTR, 2020) represent some of the key macro trends that have negatively influenced international trade with China.

From an open system point of view, understanding the marketing ecosystem and sentiment of the environment is undoubtedly an essential skill for businesses when exploring international markets (Samiee *et al.*, 2015). Trade corridors and international marketing relations require a broad understanding of the current macro environment, in particular with the increasing velocity of macro forces affecting the market. *Guanxi* may therefore be contextual, whereby outcomes are affected by macro forces prevalent in outside-in marketing situations. Based on this discussion, we offer our first research question (RQ1), as follows:

**RQ1.** To what extent are the megatrends in the study of *guanxi* largely influenced by rapid changes in the current marketing ecosystem (marketplace, technological, socioeconomic, geopolitical, and environmental factors)?

### *2.3. Breaking the ethnocentric view of guanxi – insider versus outsider*

*Guanxi* is not always viewed as a positive construct, having been linked to corruption, nepotism (Leung & Barnes, 2020; Lovett *et al.*, 1999), and opportunism (Abosag *et al.*, 2021). The *xinren* dimension was found to reduce task conflict and has a negative impact on financial performance (Yen & Abosag, 2016). A party can benefit from favors, backdoor policies, or perks (Cheng *et al.*, 2018). Scholars in the area have debated the view that *guanxi* is often misguided and perceived differently in the West compared to the East. *Guanxi* is culturally laden (Buckley *et al.*, 2006; Leung *et al.*, 2008) and only works if you are an insider or connected through gatekeepers (Badi *et al.*, 2017; Gao *et al.*, 2018; Kuo *et al.*, 2019). *Guanxi* is supported by an intricate network of relationships formed through



particularistic, relational, or family ties (Bian, 2018; Wang *et al.*, 2020).

Given that *guanxi* may depend on whether or not you are considered as an “in-group” or “out-group” member (Triandis, 1995), it can be negatively perceived by outsiders, but considered hugely positive among those on the inside. This can lead to ethnocentric behavior that affects firms’ key decisions, such as market entry or exit strategies (Kingshott *et al.*, 2019; Lee *et al.*, 2020). The recent example of US factories retracting from China to the US due to rhetoric from former US President Donald Trump to “make America great again” is one example of geopolitical forces that impact firms in a volatile international environment (White House Historical Association, 2021).

These reactions between insiders and outsiders can be due to the concept of *distance* where it has been found to impact firms’ market entry, knowledge transfer, location choices, and market performances (e.g. Johanson & Vahlne, 1977; Kogut & Singh, 1988; Xu & Shenkar, 2002). From an economic perspective (Ghemawat, 2001), China, the US, and Germany are the three largest importing and exporting countries of goods in the world, comprising 31% of the world’s exports (US\$5.62 trillion) and 32% of imports (US\$5.85 trillion) in 2019 (TrendEconomy, 2021). Following the economic significance by ranking, the US and Germany’s geographic distance and linguistic differences have high variances with China (Dow & Karunaratna, 2006; Eden & Miller, 2004). Finally, from the most contentious *cultural distance* perspective based on Hofstede’s seminal work (1984; Hofstede *et al.*, 2005; Kogut & Singh, 1988), the Euclidean distance between China and the US or Germany is high, which is likely to influence how views of *guanxi* are perceived. In response, we offer our second research question (RQ2), as follows:

**RQ2.** To what extent does the *guanxi* sentiment valence for an insider nation i.e., China differ to those of major outsider trading nations, namely the US and Germany?

2.4. *GDELT as a big data source to facilitate the outside-in marketing approach*

Big data has emerged as a leading tool in recent marketing studies. It can be classified into three main areas. First, conceptual studies have discussed theoretical arguments on how marketers should use big data (Amado *et al.*, 2018; Côrte-Real *et al.*, 2017; Grover *et al.*, 2018; Humphreys & Wang, 2018; Malthouse & Li, 2017; Sivarajah *et al.*, 2017; Zhang *et al.*, 2020b). Second, predictive analytical studies have been undertaken to explain patterns in consumer behavior (Kauffmann *et al.*, 2020; Kumar *et al.*, 2020; Liu, 2020; Liu *et al.*, 2019; Saboo *et al.*, 2016; Tirunillai & Tellis, 2014). Third, and the least applied, is to use big data analytical approaches (*descriptive* and *diagnostic* analytics) to determine “what happened”, using historical and current data to understand behavioral changes (Sivarajah *et al.*, 2017). *Predictive analytics* have also been used to identify new phenomena and exploratory insights for researchers. Moreover, *prescriptive analytics* have been used to test new concepts. This method is particularly useful to analyze “black-swan” events with extreme uncertainties (e.g., COVID-19) and to make predictions from the dynamic macro environment (Malthouse & Li, 2017; Sheng *et al.*, 2020).

This study suggests that a big data approach can provide a comprehensive view for firms so they can acquire a clear picture of all the sentiments of the macro forces at play from an outside-in approach. Through adopting such an approach, enabled via the advent of big data sources, firms may be more able to better predict or estimate complex trade relationships (Wohl & Kennedy, 2018; Dumor & Yao, 2019). Based on a Google Scholar search, as of June 2020, 1,520 academic journals and papers referred to GDELT in their studies. Moreover, there were only nine articles in business-related journals that mentioned GDELT, with just nine using it as a data source (Colladon, 2018; Elshendy & Colladon, 2017; Giuliani, 2018; Heaven, 2013; Klostermann *et al.*, 2018; Odziemkowska & Hennisz,; Wang *et al.*, 2021; Zhang *et al.*, 2020a). GDELT was used in an inter-country mass media study of China (Yuan *et al.*, 2017) and subsequent propaganda studies (Barrón-Cedeno *et al.*, 2019).

Scholars have also begun to use it to examine the trade war's impact surrounding the Belt and Road Initiative (Garcia-Herrero & Xu, 2018). Given the lack of use and the wealth of metadata available, using big data to analyze the business landscape that organizations are chartering into may provide them with a clear competitive advantage.

### **3. Methodology**

We employ the *retrospective* view (Sheng *et al.*, 2020; Sivarajah *et al.*, 2017) of how *guanxi* is seen by insiders and outsiders under the five macro forces framework to provide descriptive and diagnostic analytical information. Through analyzing unstructured big data sets (text mining, image analysis, sentiment, social network analysis, and visualization), data patterns can be quantified and explained to predict firm behavior and make *prescriptive* and *pre-emptive* recommendations (Sivarajah *et al.*, 2017). To operationalize the retrospective approach mentioned here, the study followed the big data research methodology framework recommended by Liu (2020). The procedure involves five steps: data collection, keyword determination, data visualization, data aggregation, and data analysis (Fig. 2).

#### *3.1 Selection of big data collection tools – GDELT*

This study's textual, sentiment, and visual data were retrieved from the Global Database of Events, Language and Tone (GDELT) (Leetaru & Schrodt, 2013). The news data range from 1/1/2017 to 12/8/2020. GDELT was founded by Google Jigsaw and two researchers, Leetaru and Schrodt (Heaven, 2013). The database software feeds media sources, such as Associated Press, Reuters, Xinhua (China's news agency), and Google News. Metadata is stored at 15-minute time intervals around the clock and uses a real-time streaming news machine that translates 98.4% of daily non-English news from 65 different languages into English. Collectively, the sources monitor news that covers almost every country in the world. Currently, the database stores more than 364 million global geopolitical events starting from 1979. Each year, the database adds three-quarters of a trillion sentiment assessments, 1.5

billion location references, and 70 billion images to assist in predicting and observing how global events unfold (Hopp *et al.*, 2019).

GDELT uses software that automatically extracts information from news reports and then uses natural-language processing to sort news information into data points. For example, if a news report contains the line “hundreds of thousands of people blocked streets in Hong Kong in defiance of Chinese authorities to demand democratic reforms” (Schrodt, 2012, p.71), the event is coded and the nearest location (e.g., Hong Kong) with its latitude and longitude coordinates is added to the event data. Using natural-language processing techniques, it identifies the 4Ws (who, what, when, where) to avoid duplications if mentioned in several news reports (Heaven, 2013; Hopp *et al.*, 2019, Liu *et al.*, 2019).

Scholars have been primarily using two key resources when using the GDELT database. The first one is an application program interface (API) called *GDELT Summary* that enables news from 2017 onwards to be extracted using any keyword search. The second resource, *GDELT Event Database*, stores geopolitical events that are mentioned in news articles. To extract the event, a CAMEO codebook (Conflict and Mediation Event Observations Event and Actor Codebook) is used to primarily classify events into four large categories: verbal cooperation, material cooperation, verbal conflict, and material conflict (Schrodt, 2012). Actors, for example a country such as China, will provide a geographical location and latitude-longitude coordinates. The database provides the number of mentions of the event (*NumMentions*), the total number of news outlets (*NumSources*), and the total number of source documents (*NumArticles*). Each event is assigned a Goldstein index that gives a sentiment score (*AvgTone*) from -100 (extremely negative) to +100 (extremely positive) (Goldstein, 1992). While the *GDELT Event Database* allows enquiries dating back to 1979, the CAMEO codebook does not contain the event code “guanxi”. Due to this constraint, the study uses the *GDELT Summary* API to study the guanxi phenomenon.

### 3.2 Keyword determination

After selection of big data tools, the next step is to identify suitable keywords to input into the API GDELT engine to analyze guanxi under the outside-in macro forces framework. We followed guidelines for a scoping review (Arksey & O'Malley, 2005) and co-word assessment under the bibliometric analysis method (Donthu *et al.*, 2021). The EBSCOhost Business Source Complete is used as the main database and identified a total of 45 journal articles that mentioned “guanxi”. The articles were published in English and appeared in business journals from January 2017 to August 2020. A total of 151 guanxi-related keywords were identified. Each keyword was classified under the five megatrends (marketplace, technological landscape, socioeconomic, geopolitical, and environmental factors) and key themes identified in guanxi studies. The key themes derived from guanxi studies are: guanxi (n=47), China (n=20), followed by GRX-related terms (n=30), relationship (n=30), ethics/governance (n=28), networks (n=20), marketplace/industry (n=18), and outcomes (n=15). The keywords derived from the megatrends under the ecosystem framework are as follows: Environment (n=21) is internationalization; under Technological (n=10) are innovation and social media; under Socioeconomic (n=13) are culture and gender, and under Geopolitical (n=28) are Sino-foreign collaboration and China. Table 1 outlines the keyword analysis and Figure 4 uses a word cloud representation of the top 100 keywords.

< Insert Table 1 and Fig. 4 about here >

After the keywords derived from guanxi studies were obtained, the keywords were input using the GDELT Summary API functions to generate the results (Cartledge, 2020). Using the keyword categories derived from the guanxi-related business literature, the following GDELT Summary queries were input into the GDELT Summary API function. The first formula included all the guanxi-based terms derived from the literature. As the term “guangxi province” is not related to guanxi relationships but refers to a province in south-western

China, the terms “guangxi province”, “guangxi” and “autonomous region” were specifically excluded. Query 1a addresses online news big data, and query 1b relates to images associated with guanxi sourced from online news:

*Query 1a: Human Summary: (guanxi OR ganqing OR xinren OR renqing OR face OR reciprocity OR business relationship OR Lijie OR ren OR trust OR mianzi OR mien tzu) AND NOT AND guangxi province AND NOT AND guangxi AND NOT AND autonomous region AND; AND (China OR Chinese)*

For images, the “iconic images” filter was selected:

*Query 1b: Human Summary: (guanxi OR ganqing OR xinren OR renqing OR face OR reciprocity OR business relationship OR Lijie OR ren OR trust OR mianzi OR mien tzu) AND NOT AND guangxi province AND NOT AND guangxi AND NOT AND autonomous region AND; AND (China OR Chinese) AND ImagePopularity:Iconic*

A further search was conducted comparing news from the three largest trading nations (i.e., China, US, and Germany), which were also used as source countries (China Power Team, 2020; United Nations, 2020). For image search, the “iconic images” filter was applied:

*Query 2: Human Summary: (guanxi OR ganqing OR xinren OR renqing OR face OR reciprocity OR business relationship OR Lijie OR ren OR trust OR mianzi OR mien tzu) AND NOT AND guangxi province AND NOT AND guangxi AND NOT AND autonomous region AND; AND (China OR Chinese) AND SourceCountry:China*

*Query 3: Human Summary: guanxi AND NOT AND guangxi province AND NOT AND autonomous region AND SourceCountry:United States*

*Query 4: Human Summary: guanxi AND NOT AND guangxi province AND NOT AND guangxi AND NOT AND autonomous region AND SourceCountry:Germany*

### 3.3. Data collection

A total of 685 million articles were found and a total of 162 million articles were guanxi-related. Based on the top three countries with the highest GDP in the world and trade partnership with China, the US had 43 million articles, China 17 million articles, and Germany 4 million articles (Table 2). Out of the 162 million articles, the following data were extracted from GDELT:

- (1) Volumetric analysis (*Vol*): the frequency of “guanxi terms” mentioned in online news measured by counts.
- (2) Sentiment analysis (*Sen*): The daily aggregated positive or negative sentiment mentioned in online news.
- (3) Network analysis (*Net*): The views toward the subject as reported by the network of online news reporters.

< Insert Table 2 about here >

### 3.4 Data visualization and data aggregation

In combination with co-word bibliometric analysis, data visualization techniques allow big data to be clustered and form intellectual structure where key themes can be visually uncovered (Donthu *et al.*, 2021; Heimerl *et al.*, 2014; Liu, 2020). The GDELT Summary API interface allows several data visualization approaches to visualize the big data: (1) *volume timeline*, (2) *average tone*, (3) *tone bar chart*, (4) *image tag word cloud*, (5) *image topic word cloud*, (6) *top articles*, and (7) *top images*. The description of each technique is detailed as follows:

- 1) *Volume timeline* counts the number of articles over a period, Google Trends timeline, the *average tone* of the analyses, and the average tone of all the articles, thus analyzing each article as a whole rather than referring to specific keywords.
- 2) The *tone bar chart* computes the document-level tone of each article and displays it in

a bar chart ranging from extremely negative on the left to extremely positive on the right (GDELT, 2020). The *tone bar chart* shows the sentiment distribution to determine where most of the news articles are clustered. *Sources map* provides a visual representation of the news sources by the country where the news publishing outlet issued news for the past 24 hours. *Location Maps: Countries* is another visual representation where all the geographic locations mentioned in each article in the past 24 hours are displayed, with the density of the location in different color shadings.

- 3) *Image Tag Word Cloud* uses Google's Cloud Vision API neural network deep learning algorithms. It recognizes up to 10,000 objects and activities to generate the top 75 most relevant objects and activities in a word cloud format. This function is used to understand the visual narratives used in covered articles.
- 4) *Image Topic Word Cloud* uses the same neural deep learning algorithms and labels over 2 million topics. The algorithms analyze the caption line of the images and derive the top 75 topics to provide a more in-depth analysis of the visual images mentioned in the articles. The penultimate display, *top articles*, lists the most relevant articles that match the search in question (GDELT, 2020).
- 5) Finally, API *top images* displays the most relevant images that match the search question. Images are selected based on actual semantic interpretation using Google's Cloud Vision API deep learning algorithms (GDELT, 2020).

### 3.5 Data analysis – limitations

Big data sets have drawbacks in making causal inferences as they do not use traditional empirical research methods to test reliability, internal validity, external validity, and sample designs (Hofacker *et al.*, 2016; Malthouse & Li, 2017). However, big data advocates and consumer behavior researchers suggest that such research is useful for *inductive* approaches (observing patterns, identifying research questions) and generating unexplored insights for



theory formation rather than confirmation (Hofacker *et al.*, 2016). This study therefore utilizes the advantages of big data analytics to create new angles to explore the phenomenon of guanxi. As such, traditional analyses using, for example, structural equation modeling (SEM) are not considered suitable for use in this type of investigation.

#### **4. Data analysis and findings**

The first query (*Query 1*) aimed to test research question 1 (*RQ1*) regarding the megatrends of the guanxi phenomenon (Fig. 5). The overall view of guanxi is negative, with an average tone value of -0.5 from the period 1/1/2017-31/12/2018. Based on the marketing ecosystem view, geopolitical events had an impact on perceptions of guanxi, with the lowest point being 4 June 2017, the anniversary of the Tiananmen Square event. The trade war between the US and China started in March 2018 and ended in December 2018 at the G20 Summit in Buenos Aires (Wong & Koty, 2020). The tone exceeded 0 to an average of 0.03 in the period 1/1/2019-30/8/2019 and peaked on 19 May 2019, when China agreed to reduce the trade deficit with the US. The second ecosystem factor reflected the environmental trend driven by COVID-19, which also influenced views of guanxi. Perceptions of guanxi started to experience a downward curve, where the sentiment bottomed out to -1.3846 on 22 March 2020, when Italy's COVID-19 death rate exceeded that of China. The tone reached the second low of -1.3208 on 5 April 2020 when the virus was claimed to be asymptomatic. The sentiment slowly climbed back up to -0.79 from April to August of 2020.

< Insert Figures 5 and 6 about here >

When sentiment was analyzed through the *tone bar chart* (Fig. 6), the mean was -1.83 with a standard deviation of 0.89. Articles showing a neutral sentiment (Tone = 0, n=1,373,335) displayed the highest tone bar, while the total number of articles with negative sentiment (Tone = -1 to -50, n = 5,341,844) exceeded the total number of articles with positive sentiment (Tone = +1- +50, n = 2,962,997) by 55%. We find an average tone of

-1.83 and a low standard deviation in coverage of guanxi by news outlets around the world. When analyzing the narratives mentioned with the images used in guanxi articles via *Image topic Word Cloud* (Fig. 7), the top 75 images to embrace narratives used in the articles further validated the same trends. The key images were China, coronavirus-2019 (virus, coronavirus, severe acute respiratory syndrome, coronavirus 2), Xi Jinping (President of the People's Republic of China), and Xinhua News Agency. The findings revealed that guanxi narratives during the period 2017-2019 were overwhelmed by the environmental factor in the marketing ecosystem, the COVID-19 pandemic, and the geopolitical factor with the image of the leader of China, President Xi. Most news sources came from Sina Group and Xinhua News agency. Guanxi narratives appear highly related to business activities (company names such as Huawei, Alibaba Group, and Financial Services) and are associated with formal and highly power driven individuals (e.g., officials, spokespersons). Guanxi is often connected to ceremonies and entertainment.

< Insert Figures 7, 8, and 9 about here >

Reviewing the images used in guanxi articles, the *Image Tag Word Cloud* API iconic images (Fig. 8) identified the 75 most relevant objects using a deep learning algorithm. When guanxi was mentioned, the key images that were displayed included events, architecture (e.g., buildings), speech, spokespersons, public speaking, and officials. *Top Images* (Fig. 9) showed official occasions, including press conferences by key political figures and chairmen of corporations. These images provide corroboratory evidence for guanxi being influenced by geopolitical events and validating guanxi as a Chinese way of doing business, being formal, authoritative, and official. The data suggest that during these three years, perceptions of guanxi were heavily influenced by geopolitical trends triggered by international protectionism (US-China trade war, G20 summit truce, and Tiananmen Square anniversary). Furthermore, environmental factors triggered by the COVID-19 pandemic created

particularly large variances in the tone of news reports around the world. Perceptions of guanxi often changed direction after key significant milestones were announced on the news.

In testing research question 2 (RQ2), surrounding *the guanxi sentiment valence for an insider nation (China) against major outsider trading countries (US and Germany)*, the data revealed strong support in variance between the two (Table 3 and Fig. 10). The average tone for news articles from January 2017 to August 2020 was 0.41 for China, -0.65 for the US, and -0.91 for Germany. Guanxi was considered positive in China, whereas in the US and Germany it appeared negative. The correlation of the sentiments during the observation period between China and the US was 0.11, China and Germany 0.19, and the US and Germany 0.18. This would suggest the three countries' sentiments toward guanxi did not seem to have a close correlation with each other. However, when viewed at certain times during the three-year period, some correlations were evident (see Table 3).

< Insert Table 3 and Figure 10 about here >

For the year 2017, the correlation of the tone for guanxi between China and the US / Germany was low, ranging from 0.1 to 0.2, whereas the same correlation between the US and Germany was high, at 0.5. We call this period "*normal guanxi relations*" as China's tone on guanxi did not correlate with the US or Germany, whereas the US and Germany were highly correlated (0.5). The President of the United States, Donald Trump, was inaugurated on 20 January 2017. Xi Jinping, General Secretary of the Chinese Communist Party, visited Trump's holiday home in Florida in April and they made a trade deal in May 2017. Trump then returned the favor and visited China in November 2017 (Wong & Koty, 2020). This suggests that when the countries' relations (geopolitical factors) are relatively stable, guanxi is viewed as relatively positive. A clear correlation pattern can be seen, where China is viewed as an "insider" and the US and Germany as "related outsiders".

In the first half of 2018, the correlation between the tone of China and US articles on

guanxi increased to 0.25 and 0.34 respectively throughout the year, whereas China and Germany's tone correlation remained unchanged. Later, the correlation of the tone toward guanxi between the US and Germany declined to 0.18 and 0.26, respectively. We call this period "*negative guanxi relations*", whereby both the US and China conveyed negative tones in news reports. This period was marked by the "trade war" from March to December 2018 (Wong & Koty, 2020). As the news concentrated on US and China relations, the tone in Germany's media was not in line with that of the US and China. The "US trade war" correlates with the views of guanxi between US and China, but not between Germany and China, which supports the geopolitical country-specific factor.

In 2019, a negative correlation was evident between China and the US, with sentiments toward guanxi of -0.25 and -0.15 respectively, while the correlation between China and Germany dropped to 0. The tension surrounding trade talks with the US and China intensified, leading to cancellation of negotiation talks in March 2019, an increase in tariffs by the US on China from 10% to 25%, and China's subsequent retaliation. There was also a ban on Huawei sales in the US in May 2019 and further threats to add tariffs. The tone of news between the US and Germany went from a correlation of 0.06 in the first half of the year to 0.49 in the second half, marking a significant change of perspectives. We call this the "*hostile guanxi relations*" period between the US and China. Germany did not take sides with either country in the first half of 2019, while in the second half of 2019, Germany's sentiment turned in the same direction as the US to a negative tone. This supports how geopolitical factors impact views of guanxi for "outsiders" over a period when the geopolitical factor remains to be a key agenda in the news cycle. Germany switched sides from being an "unrelated outsider" to a "related outsider".

The Hong Kong extradition law sparked a series of violent protests between students, activists, and police. At the pinnacle of the violent protest, in November 2019, students and

activists barricaded themselves inside Hong Kong Polytechnic University as police surrounded the campus. The incident led to the arrest of 1,100 students (Reuters, 2020). The first eight months of 2020 marked zero correlations on tones between China and the US, whereas China and Germany showed a 0.36 correlation, and the US and Germany showed 0.4, leading to “*normal guanxi relations*”. The violent protests in Hong Kong ended after the Polytechnic University incident and the outbreak of COVID-19 in January-August 2020 (Fig. 3). This reflects how social movements (Hong Kong extradition law) and the environmental factor (COVID-19) in the marketing ecosystem affect the “insider” and “outsider” status of *guanxi*. It also suggests that the views of “insiders” and “outsiders” are permeable and evolving. Marketing ecosystem factors affect views when each country (US, China, and Germany) consider themselves an in-group member, as well as when they consider themselves an out-group member.

The three countries’ sentiments were analyzed through the *tone bar chart* (Fig. 11) API. The tone’s mean, variance, and standard deviation are presented in Table 4. Overall, China’s tone is -1.9, the US is -2.38, and Germany is -2.35, with a low standard deviation range of 0.42-0.47. Among the three countries, the US had the highest number of articles exhibiting a neutral tone (Tone = 0, n (US) = 355,896; n (China) = 176,283, n (Germany) = 38,234). This suggests the tone toward *guanxi* was hovering around the negative range among the three countries (-1.9 to -2.38). Between 2017 and 2020, *guanxi* was considered negative and there was a consensus across the news outlets sourced from each country. It suggests that geopolitical and environmental factors have a negative impact on perceptions of *guanxi* between the three key trading partners.

< Insert Table 4 and Figure 11 about here >

In *guanxi* topics derived from the *Image topic Word Cloud* (Fig. 12) sourced from China, the top images were coronavirus-2019 (virus, severe acute respiratory syndrome coronavirus,

COVID-19 testing, asymptomatic, disease outbreak, infection, Wuhan Institute of Virology, nucleic acid test, Hubei, and Wuhan). The most frequent images of China were represented by the Chinese government, Xi Jinping (President of the People's Republic of China, General Secretary of The Communist Party of China, General Secretary Xi Jinping Important Speech Series), media, and the United States. As with news sourced worldwide (Figs. 7 and 8), news sourced from China was overwhelmed by the COVID-19 pandemic and by the leader of China, President Xi. Sina Corp and Xinhua News Agency were the key news outlets disseminating such stories (Fig. 12). This supports the notion that China considered the pandemic environmental factor as the key factor influencing guanxi.

< Insert Figure 12 about here >

Guanxi topics derived from *Image topic Word Cloud* (Fig. 13) sourced from the US had a very different representation. The top images and the related captions were court, China, coronavirus, 2019 Hong Kong protests (Hong Kong, demonstration, trial, crime, tear gas, police brutality, Hong Kong Police Force, riot police, crowd control, rubber bullet), minister, looting, Prime Minister of Malaysia (graft, Malaysia Development Berhad, Malaysia), scandal, 2019-20 coronavirus pandemic (pandemic, World Health Organization), and politics. Most images were disseminated from Reuters. With COVID-19 and Xi Jinping the most frequently shown images in China, news from the US primarily considered guanxi to be negative. This is illustrated by the recent Hong Kong extradition law protests and police brutality, as well as the huge fraud scandal involving the Prime Minister of Malaysia. These images suggest that the US view of guanxi is negatively influenced by geopolitical factors and moral ideals (e.g., human rights). Violating this social ideal (social factor in the marketing ecosystem) negatively affects views on guanxi.

< Insert Figures 13 and 14 about here >

Guanxi images derived from *Image topic Word Cloud* (Fig. 14) sourced from German

news were related to China, coronavirus disease 2019 (infection, virus, severe acute respiratory syndrome coronavirus 2, 2019-20 coronavirus pandemic, health, vaccine, severe acute respiratory syndrome, pandemic, patient, surgical mask, protective face mask, lockdown, symptom, FFP mask, mask, respirator, World Health Organization), United States, President of the United States, and Xi Jinping. The German view of guanxi appears to be influenced by geopolitical factors (US and China relations and their leaders) and the environmental factor (COVID-19).

To summarize research question 2 with the “insider” being China, and “outsiders” being US and Germany, we infer that the two groups viewed guanxi very differently. The data suggests that two macro forces (geopolitical and environmental factors) are influencing views (Aragon-Correa, *et al.*, 2020). China focused on their country’s leader and health-related issues as a priority for guanxi during the observed period (2017-2020). The US, on the other hand, focused on democracy, human rights, and key corruption scandals when guanxi was being portrayed in the US press. Finally, Germany viewed guanxi as being more important between the US and China, while COVID-19 and medical supplies appeared to be very significant issues when guanxi was viewed between Germany and China.

## **5. Discussion**

Most empirical studies on the notion of guanxi have tended to use cross-sectional survey-based approaches with somewhat constrained samples. Such studies may not necessarily provide a full picture, particularly on how this important Chinese cultural phenomenon is perceived around the world. This study has attempted to fill an important research gap by using big data analytics to conduct a longitudinal study consisting of millions of articles and images from news sources around the world. The approach provides a global sentiment value and imagery description surrounding the notion of guanxi. This is the first study to adopt the GDELT news summary API function, which was used to analyze 162 million articles based

on key terms found within the guanxi literature. The findings provide a metadata view of guanxi from the world's three leading trading countries and specifically compared the 'insider' i.e., China (n=16.6 million articles) with the world's top 'outsiders', that is the US (n=42.9 million articles) and Germany (n=4.2 million articles).

The findings address research question 1, illustrating that megatrends in perceptions of guanxi during the period 2017-2020 are highly influenced by key political and public health events, notably, the US-China trade war and events such as Tiananmen Square, the G20 and COVID-19. The findings also support research question 2, where the sentiment valence between the insider (China) has large variance with those of outsiders (the US and Germany). The sentiment tone of guanxi between insiders and outsiders can be classified into three stages. The first stage had *normal guanxi relations* (2017), whereby China's (insider) tone did not correlate with the US / Germany's (outsider) tone, and the outsiders were highly correlated in terms of their news views toward guanxi.

The second stage, the first half of 2018, represented *negative guanxi relations*, where the US and China both exhibited a negative tone and Germany was on the sideline during the US-China trade war period. The third stage, the *hostile guanxi relations* period, was marked by intensity resulting from the trade war. The first half of 2019 saw a negative correlation in the tone between China and the US. Germany had no correlation with China. In the second half of 2019, Germany started to agree with the US, possibly due to Hong Kong's extradition law. In 2020, negative perceptions about China's role in the emergence of COVID-19 resulted in *negative guanxi relations* in the first quarter of 2020, followed by *normal guanxi relations* when COVID-19 became the "new norm". Interestingly, the German view correlated with both China and US, but the US experienced no correlation with China (Table 5). From this finding it seems that both China and Germany value health concerns, but Germany may agree with the US's view that the COVID-19 outbreak stemmed from China.



Thus, our data analysis provides a nuanced view of these relationships.

< Insert Table 5 about here >

### *5.1. Theoretical implication*

This research adds to the literature by being the first study to draw on big data sources to examine guanxi. The study further contributes to the guanxi and international business literature in several ways. First, the research provides a unique longitudinal analysis of guanxi between the world's three largest trading nations i.e., China, Germany, and the US. This represents a field of study in which Sino-US relations have tended to dominate (e.g., Abosag *et al.*, 2021). By drawing on data from some 163 million articles, we are able to capture the phenomenon at a much larger scale than traditional archival methods (Wang *et al.*, 2021).

Second, sentiment data based on media-reported events provide researchers with an opportunity to compare and develop univariate country-level measures. Arguably, this method can help us to better understand such theoretical constructs and connections (Baker *et al.*, 2016; Caldara & Iacavello, 2018; Wang *et al.*, 2021; Zelner *et al.*, 2009), including guanxi networks (e.g., Burt & Burzynska, 2017). Our study posits that the Goldstein sentiment index can be used to measure the strength of guanxi ties at a country/city level. As evidenced by the correlation figures, the strength of guanxi between these three countries can shift from being instrumental to intermediate (Hwang, 1987). The emotional element of guanxi (ganqing), may have led Germany to take the side of the US on human rights grounds, perhaps relating to the sentiment surrounding the case of the Hong Kong students during the demonstrations. It confirms that guanxi can also be based on relational and psychological distance between parties, i.e., China and the outsiders, namely the US and Germany (Chen & Chen, 2004). Moreover, this provides some corroboratory evidence to support Berger *et al.*'s (2018) findings relating to guanxi's 'paradoxical' state in different contexts.

The third contribution is that home-host relations can be better represented through the lens of longitudinal data. Through drawing on such data, we are able to better analyze cooperative and adversarial events under different macro conditions to measure and determine whether home-host relations are consistent over time (Wang *et al.*, 2021). The data also provides an opportunity to evaluate multi-actors that are in play, in this case, China, the US, and Germany. In particular, the data suggest that actors can change their views of guanxi at different periods as the agenda shifts due to changes in values attached to specific issues. This finding supports the notion that geopolitical macro forces such as “human rights” and the “US-China trade war” can influence states of guanxi between the US, Germany, and China (Chen & Chen, 2004; Hwang, 1987). This, in turn, supports those findings of Wang *et al.* (2021), that key managerial decisions, such as foreign direct investment are sensitive to geopolitical events. This method can complement other well-established survey-based measures, including the work on cultural distance and institutional distance (Shenkar *et al.*, 2020), as well as that on environmental conditions and market turbulence (Zhou *et al.*, 2021).

The fourth contribution of this study relates to the analysis of images, which is another breakthrough in guanxi studies. Indeed, the views from different countries reveal very different perceptions of guanxi. The US considered guanxi as corruption, an abuse of power and brutality, whereas China viewed guanxi as being positive and part of everyday business practice. Germany’s perspective of guanxi during this period focused on US-China relations and public health concerns. Key political and public health events heavily impact the sentiment of guanxi and provide support of the need to use metadata to gauge changes in the macro-environment and its influence on perceptions of guanxi (George *et al.*, 2014).

Overall, this study has proven useful for further validating our understanding that guanxi is not static but evolves and changes according to macro forces. An important new implication for guanxi researchers is that this methodology and trend allows sentiment toward

guanxi to be monitored and predicted. The approach can provide triangulated support for studies examining the correlations of certain topics, e.g., COVID-19 and guanxi.

### *5.2. Managerial implications*

For business practitioners, big data offers a powerful tool for conducting environmental scanning at any level (macro, meso, or micro). The tool is user-friendly, it operates in real-time and is universal in nature, thus helping to overcome issues relating to variety, velocity, and volume (Zhang *et al.*, 2020b). It is helpful for business practitioners to have the most up-to-date knowledge of the business landscape to identify changes in guanxi that relate to key events, countries, or competitors. This study supports the findings of Merendino *et al.* (2018) by helping to stimulate adaptive ability among senior management.

The findings also have important implications for management when determining market trends through using GDELT to ascertain the sentiment of international relations. Businesses can therefore specify the trading partner or country they are dealing with and gauge their sentiment toward conducting business. They can also devise pre-emptive strategies to move ahead in the market. This approach allows businesses and countries to capture information that may prove useful for assisting in decision making and planning. The technology used also offers fresh insights for scanning the macro-environment. The GDELT summary used in this study enables practitioners to input appropriate parameters and determine strategies to help identify rapid changes in the marketplace.

## **6. Limitations and future research**

This research has several limitations. First, the study used the GDELT Summary's API function, where the translation of sentiment values, translation of languages, and images around the world use deep learning algorithms. The accuracy of the translation and interpretation cannot be fully validated, therefore it relies somewhat on the researchers to interpret the results and adjust their queries accordingly. Second, the research examines

guanxi from a sentiment point of view to determine an overall view and comparison among the subject countries. GDELT Summary is limited to particular and available interfaces. Researchers who wish to explore a specific topic would need to use GDELT's other functions, such as GDELT Events. Moreover, interpretation of the metadata requires an experienced researcher who can correlate the findings with a plausible explanation of the market trends presented in GDELT Summary. A novice researcher or junior executive may not be able to interpret the results presented through the big data engine.

In summary, the introduction of GDELT as a big data analytical tool provides opportunities for researchers to validate their research questions before establishing specific hypotheses. Qualitative research for two-phased methodologies such as interviewing key experts may be substituted with the GDELT function as it can provide much richer data and empirical support than can be obtained from expert opinions. The study suggests that guanxi represents a highly sentimental construct that needs to be constantly reviewed and explored when the marketing ecosystem changes. Researchers and businesses that operate in China can therefore use GDELT to regularly gauge shifts in sentiment to acquire much deeper and richer insights for helping to make key decisions and reduce risk.

## References

- Abosag, I., Yen, D. A. W., Barnes, B. R., & Gadalla, E. (2021). Rethinking guanxi and performance: Understanding the dark side of Sino-US business relationships. *International Business Review*, 30(4), 101775.
- Alvarez, G., Choi, J., & Strover, S. (2020). Good news, bad news: A sentiment analysis of the 2016 election Russian Facebook ads. *International Journal of Communication*, 14(2020), 3027-3053.
- Amado, A., Cortez, P., Rita, P., & Moro, S. (2018). Research trends on big data in marketing: A text mining and topic modeling based literature analysis. *European Research on Management and Business Economics*, 24(1), 1-7.
- Ambler, T., Styles, C., & Wang, X. (1999). The effect of channel relationships and guanxi on the performance of inter-province export ventures in the People's Republic of China. *International Journal of Research in Marketing*, 16(1), 75-87.
- Aragon-Correa, J. A., Marcus, A. A., & Vogel, D. (2020). The effects of mandatory and voluntary regulatory pressures on firms' environmental strategies: A review and

- recommendations for future research. *Academy of Management Annals*, 14(1), 339-365.
- Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, 8(1), 19-32.
- Badi, S., Wang, L., & Pryke, S. (2017). Relationship marketing in guanxi networks: A social network analysis study of Chinese construction small and medium-sized enterprises. *Industrial Marketing Management*, 60, 204-218.
- Baker, S.R., Bloom, N., & Davis, S.J. (2016). *Measuring economic policy uncertainty*. *Quarterly Journal of Economics*, 131(4), 1593-1636.
- Baker, M., & Wurgler, J. (2007). Investor sentiment in the stock market. *Journal of Economic Perspectives*, 21(2), 129-152.
- Barnes, B. R., Yen, D., & Zhou, L. (2011). Investigating guanxi dimensions and relationship outcomes: Insights from Sino-Anglo business relationships. *Industrial Marketing Management*, 40(4), 510-521.
- Barnes, B. R., Leonidou, L. C., Siu, N. Y., & Leonidou, C. N. (2010). Opportunism as the inhibiting trigger for developing long-term-oriented Western exporter–Hong Kong importer relationships. *Journal of International Marketing*, 18(2), 35-63.
- Barnes, B. R., Leonidou, L. C., Siu, N. Y. M., & Leonidou, C. N. (2015). Interpersonal factors as drivers of quality and performance in Western–Hong Kong interorganizational relationships. *Journal of International Marketing*, 23(1), 23-49.
- Barrón-Cedeno, A., Jaradat, I., Da San Martino, G., & Nakov, P. (2019). Propopy: Organizing the news based on their propagandistic content. *Information Processing & Management*, 56(5), 1849-1864.
- Berger, R., & Herstein, R. (2012). The limits of guanxi from the perspective of the Israeli diamond industry. *Journal of Chinese Economic and Foreign Trade Studies*, 5(1), 29-41.
- Berger, R., Herstein, R., Silbiger, A., & Barnes, B. R. (2018). Is guanxi universal in China? Some evidence of a paradoxical shift. *Journal of Business Research*, 86, 344-355.
- Beugelsdijk, S., Kostova, T., Kunst, V. E., Spadafora, E., & van Essen, M. (2018). Cultural distance and firm internationalization: A meta-analytical review and theoretical implications. *Journal of Management*, 44(1), 89-130.
- Bian, Y. (1997). Bringing strong ties back in: Indirect ties, network bridges, and job searches in China. *American Sociological Review*, 62(3), 366-385.
- Bian, Y. (2018). The prevalence and the increasing significance of guanxi. *The China Quarterly*, 235, 597-621.
- Burt, R. S., & Burzynska, K. (2017). Chinese entrepreneurs, social networks, and guanxi. *Management and organization review*, 13(2), 221-260.
- Brinch, M., Gunasekaran, A., & Wamba, S. F. (2021). Firm-level capabilities towards big data value creation. *Journal of Business Research*, 131, 539-548.
- Buckley, P. J., Clegg, J., & Tan, H. (2006). Cultural awareness in knowledge transfer to China—The role of guanxi and mianzi. *Journal of World Business*, 41(3), 275-288.
- Caldara, D., & Iacoviello, M. (2018). *Measuring geopolitical risk*. FRB International Finance Discussion Paper 1222. <https://www.federalreserve.gov/econres/ifdp/files/ifdp1222.pdf>
- Cartledge, C. (2020). *Big data potential of the global database of events, language, and tone (GDELT)*. Available online: <http://clc-ent.com/TBDE/Docs/gdeltReport.pdf>
- Chen, X. P., & Chen, C. C. (2004). On the intricacies of the Chinese guanxi: A process model of guanxi development. *Asia Pacific Journal of Management*, 21(3), 305-324.
- Chen, C. C., Chen, X., & Huang, S. (2013). Chinese guanxi: An integrative review and new

- directions for future research. *Management and Organization Review*, 9(1), 167-207.
- Cheng, L. T., Chan, R. Y., & Leung, T. (2018). Impact of perk expenditures and marketing expenditures on corporate performance in China: The moderating role of political connections. *Journal of Business Research*, 86, 83-95.
- China Power Team. (2020, August 25). *Is China the world's top trader?*  
<https://chinapower.csis.org/trade-partner/>
- Colladon, A. F. (2018). The semantic brand score. *Journal of Business Research*, 88, 150-160.
- Côrte-Real, N., Oliveira, T., & Ruivo, P. (2017). Assessing business value of big data analytics in European firms. *Journal of Business Research*, 70, 379-390.
- Day, G. S., & Moorman, C. (2010). *Strategy from the outside in: Profiting from customer value*. New York: McGraw Hill Professional.
- Dhaoui, C., Webster, C. M., & Tan, L. P. (2017). Social media sentiment analysis: Lexicon versus machine learning. *Journal of Consumer Marketing*, 34(6), 480-488.
- Dobrucalı, B. (2019). The role of guanxi on international business-to-business relationships: A systematic review and future directions. *Journal of Business & Industrial Marketing*, 35(7), 1125-1140.
- Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, 133, 285-296.
- Dow, D., & Karunaratna, A. (2006). Developing a multidimensional instrument to measure psychic distance stimuli. *Journal of International Business Studies*, 37(5), 578-602.
- Dumor, K., & Yao, L. (2019). Estimating China's trade with its partner countries within the Belt and Road Initiative using neural network analysis. *Sustainability*, 11(5), 1-22.
- Eden, L., & Miller, S. R. (2004). Distance matters: Liability of foreignness, institutional distance and ownership strategy. In M.A. Mitt & J.L.C. Cheng (Eds.), *Theories of the multinational enterprise: Diversity, complexity and relevance*. (pp. 187-221). Emerald.
- Elshendy, M., & Colladon, A.F. (2017). Big data analysis of economic news: Hints to forecast macroeconomic indicators. *International Journal of Engineering Business Management*, 9, 1-12.
- Feuerriegel, S., & Gordon, J. (2018). Long-term stock index forecasting based on text mining of regulatory disclosures. *Decision Support Systems*, 112, 88-97.
- Gao, H., Ballantyne, D., & Knight, J. G. (2010). Paradoxes and guanxi dilemmas in emerging Chinese-Western intercultural relationships. *Industrial Marketing Management*, 39(2), 264-272.
- Gao, H., Ren, M., & Miao, Q. (2018). Toward a yin-yang balancing perspective of relational (guanxi) gatekeeping in international exchange relationships in China. *Journal of International Marketing*, 26(2), 22-42.
- Garcia-Herrero, A., & Xu, J. (2018). *Trade fear behind the image of the Belt and Road Initiative: A big data analysis*.  
<https://www.cb.cityu.edu.hk/ef/doc/GRU/GBG%202018/Alicia%20GARCIA-HERRERO.pdf>
- GDELT. (2020). *GDELT translingual: Translating the planet – the GDELT project*.  
<https://bit.ly/3zHzWhP>
- George, G., Haas, M. R., & Pentland, A. (2014). Big data and management. *Academy of Management Journal*, 57(2), 321-326.

- Ghemawat, P. (2001). Distance still matters. *Harvard Business Review*, 79(8), 137-147.
- Giuliani, E. (2018). Why multinational enterprises may be causing more inequality than we think. *Multinational Business Review*, 27(3), 369-385.
- Goldstein, J. S. (1992). A conflict-cooperation scale for WEIS events data. *Journal of Conflict Resolution*, 36(2), 369-385.
- Grover, V., Chiang, R. H. L., Liang, T.-P., & Zhang, D. (2018). Creating strategic business value from big data analytics: A research framework. *Journal of Management Information Systems*, 35(2), 388-423.
- Gu, F. F., Hung, K., & Tse, D. K. (2008). When does guanxi matter? Issues of capitalization and its dark sides. *Journal of Marketing*, 72(4), 12-28.
- Heaven, D. (2013). World's largest events database could predict conflict. *New Scientist*, 218(2916), 19-20.
- Heimerl, F., Lohmann, S., Lange, S., & Ertl, T. (2014). *Word cloud explorer: Text analytics based on word clouds*. [Paper Presentation]. 2014 47th Hawaii International Conference on System Sciences, (HICSS), Waikoloa.
- Hofacker, C. F., Malthouse, E. C., & Sultan, F. (2016). Big data and consumer behavior: Imminent opportunities. *Journal of Consumer Marketing*, 33(2), 89-97.
- Hofstede, G. H. (1984). *Culture's consequences: International differences in work-related values*. Sage.
- Hofstede, G., Hofstede, G. J., & Minkov, M. (2005). *Cultures and organizations: Software of the mind*. McGraw-Hill.
- Hopp, F. R., Schaffer, J., Fisher, J. T., & Weber, R. (2019). iCoRe: The GDELT interface for the advancement of communication research. *Computational Communication Research*, 1(1), 13-44.
- Humphreys, A., & Wang, R. J.-H. (2018). Automated text analysis for consumer research. *Journal of Consumer Research*, 44(6), 1274-1306.
- Hwang, K. (1987). Face and favor: The Chinese power game. *American Journal of Sociology*, 92(4), 944-974.
- Johanson, J., & Vahlne, J.-E. (1977). The internationalization process of the firm—a model of knowledge development and increasing foreign market commitments. *Journal of International Business Studies*, 8(1), 23-32.
- Kauffmann, E., Peral, J., Gil, D., Ferrández, A., Sellers, R., & Mora, H. (2020). A framework for big data analytics in commercial social networks: A case study on sentiment analysis and fake review detection for marketing decision-making. *Industrial Marketing Management*, 90, 523-537.
- Kingshott, R., Sharma, P., Hosie, P., & Davcik, N. (2019). Interactive impact of ethnic distance and cultural familiarity on the perceived effects of free trade agreements. *Asia Pacific Journal of Management*, 36(1), 135-160
- Klostermann, J., Plumeyer, A., Böger, D., & Decker, R. (2018). Extracting brand information from social networks: Integrating image, text, and social tagging data. *International Journal of Research in Marketing*, 35(4), 538-556.
- Kogut, B., & Singh, H. (1988). The effect of national culture on the choice of entry mode. *Journal of International Business Studies*, 19(3), 411-432.
- Kumar, A., Shankar, R., & Aljohani, N. R. (2020). A big data driven framework for demand-driven forecasting with effects of marketing-mix variables. *Industrial Marketing Management*, 90, 493-507.

- Kumar, R., & Worm, V. (2003). Social capital and the dynamics of business negotiations between the northern Europeans and the Chinese. *International Marketing Review*, 20(3), 262-285.
- Kuo, M., Zhu, D., & White, L. P. (2019). An integrated B2B guanxi model: A Taiwan perspective. *Journal of Relationship Marketing*, 19(4), 309-328.
- Lee, L. W., Tang, Y., Yip, L. S., & Sharma, P. (2018). Managing customer relationships in the emerging markets—guanxi as a driver of Chinese customer loyalty. *Journal of Business Research*, 86, 356-365.
- Lee, L. W., Leung, T., & Sharma, P. (2020). Exploring Hong Kong's role as a strategic partner for "Belt and Road" countries—closing the cultural gap. In E. M. H. Chan & A. Gunasekaran (Eds.), *Belt and Road Initiative—collaboration for success* (pp. 63-76) Springer.
- Leetaru, K., & Schrodt, P. A. (2013). GDELT: Global data on events, location, and tone, 1979-2012. *ISA Annual Convention*, 2(4), 1-49.
- Leung, T., Heung, V. C., & Wong, Y. (2008). Cronyism: One possible consequence of guanxi for an insider: How to obtain and maintain it? *European Journal of Marketing*, 42(1/2), 23-34.
- Leung, T., & Barnes, B. R. (2020). Ethical cronyism: An insider approach for building guanxi and leveraging business performance in China. *Asia Pacific Business Review*, 26(2), 124-148.
- Liu, X. (2020). Analyzing the impact of user-generated content on B2B firms' stock performance: Big data analysis with machine learning methods. *Industrial Marketing Management*, 86, 30-39.
- Liu, X., Shin, H., & Burns, A. C. (2019). Examining the impact of luxury brand's social media marketing on customer engagement: Using big data analytics and natural language processing. *Journal of Business Research*, 125, 815-826.
- Lovett, S., Simmons, L. C., & Kali, R. (1999). Guanxi versus the market: Ethics and efficiency. *Journal of International Business Studies*, 30(2), 231-247.
- Lu, T., Zhuang, M., & Zhuang, G. (2021). When does guanxi hurt interfirm cooperation? The moderating effects of institutional development and IT infrastructure capability. *Journal of Business Research*, 125, 177-186.
- Malthouse, E. C., & Li, H. (2017). Opportunities for and pitfalls of using big data in advertising research. *Journal of Advertising*, 46(2), 227-235.
- Marketing Science Institute. (2018, May 13). *2018-2020 research priorities: Marketers' strategic imperatives*. <https://www.msi.org/articles/marketers-top-challenges-2018-2020-research-priorities/>
- Marketing Science Institute. (2020, May 7). *2020-2022 research priorities*. <https://www.msi.org/wp-content/uploads/2020/09/MSI-2020-22-Research-Priorities-final.pdf>
- Merendino, A., Dibb, S., Meadows, M., Quinn, L., Wilson, D., Simkin, L., & Canhoto, A. (2018). Big data, big decisions: The impact of big data on board level decision-making. *Journal of Business Research*, 93, 67-78.
- Musarra, G., & Morgan, N. A. (2020). Outside-in marketing: Renaissance and future. *Industrial Marketing Management*, (89), 98-101.
- Niu, Y., Deng, F., & Hao, A. W. (2020). Effect of entrepreneurial orientation, collectivistic orientation and swift guanxi with suppliers on market performance: A study of e-



- commerce enterprises. *Industrial Marketing Management*, 88, 35-46.
- Odziemkowska, K., & Henisz, W. J. (2021). Webs of influence: Secondary stakeholder actions and cross-national corporate social performance. *Organization Science*, 32(1), 233-255.
- Park, S. H., & Luo, Y. (2001). Guanxi and organizational dynamics: Organizational networking in Chinese firms. *Strategic Management Journal*, 22(5), 455-477.
- Peng, M. W., & Luo, Y. (2000). Managerial ties and firm performance in a transition economy: The nature of a micro-macro link. *Academy of Management Journal*, 43(3), 486-501.
- Quach, S., Thaichon, P., Lee, J., Weaven, S., & Palmatier, R. W. (2020). Toward a theory of outside-in marketing: Past, present, and future. *Industrial Marketing Management*, 89, 107-128.
- Reuters. (2020). Timeline: Key dates in Hong Kong's anti-government protests. Retrieved from <https://www.reuters.com/article/us-hongkong-protests-timeline-idUSKBN236080>
- Rust, R. T. (2020). Outside-in marketing: Why, when and how? *Industrial Marketing Management*, 89, 102-104.
- Saboo, A. R., Kumar, V., & Park, I. (2016). Using big data to model time-varying effects for marketing resource (re) allocation. *MIS quarterly*, 40(4), 911-939.
- Samiee, S., Chabowski, B. R., & Hult, G. T. M. (2015). International relationship marketing: Intellectual foundations and avenues for further research. *Journal of International Marketing*, 23(4), 1-21.
- Schrodt, P. (2012). *CAMEO conflict and mediation event observations event and actor codebook*, <http://data.gdeltproject.org/documentation/CAMEO.Manual.1.1b3.pdf>
- SCMP. (2020, June 1). US-China trade war. *South China Morning Post*. Retrieved from <https://www.scmp.com/knowledge/topics/us-china-trade-war/news>
- Shenkar, O., Tallman, S. B., Wang, H., & Wu, J. (2020). National culture and international business: A path forward. *Journal of International Business Studies*, 1-18.
- Sheng, J., Amankwah-Amoah, J., Khan, Z., & Wang, X. (2020). COVID-19 pandemic in the new era of big data analytics: Methodological innovations and future research directions. *British Journal of Management*, 0, 1-20.
- Sivarajah, U., Kamal, M. M., Irani, Z., & Weerakkody, V. (2017). Critical analysis of big data challenges and analytical methods. *Journal of Business Research*, 70, 263-286.
- The World Bank Group. (2020, July 30). *World development indicators*. <https://datacatalog.worldbank.org/dataset/world-development-indicators>
- Tirunillai, S., & Tellis, G. J. (2014). Mining marketing meaning from online chatter: Strategic brand analysis of big data using latent dirichlet allocation. *Journal of Marketing Research*, 51(4), 463-479.
- TrendEconomy. (2021, Aug 8). *World merchandise exports and imports by commodity (HS02)*. [https://trendeconomy.com/data/commodity\\_h2/TOTAL](https://trendeconomy.com/data/commodity_h2/TOTAL)
- Triandis, H. C. (1995). *Individualism & collectivism*. Westview Press.
- United Nations. (2020). <https://comtrade.un.org/data/>
- USTR. (2020). *The People's Republic of China*. <https://ustr.gov/countries-regions/china-mongolia-taiwan/peoples-republic-china>
- Wang, J. J., Shi, W., Lin, Y., & Yang, X. (2020). Relational ties, innovation, and performance: A tale of two pathways. *Industrial Marketing Management*, 89, 28-39.

- Wang, D., Weiner, R. J., Li, Q., & Jandhyala, S. (2021). Leviathan as foreign investor: Geopolitics and sovereign wealth funds. *Journal of International Business Studies*, 52, 1238-1255.
- Wohl, I., & Kennedy, J. (2018). *Neural network analysis of international trade*. US International Trade Commission: Washington, DC, USA.
- White House Historical Association. (2021). *Presidents, Donald Trump, the 45th president of the United States*. Retrieved from <https://www.whitehouse.gov/about-the-white-house/presidents/donald-j-trump/>
- Wong, D., & Koty, A. C. (2020, August 25). *The US-China trade war: A timeline*. Retrieved from <https://www.china-briefing.com/news/the-us-china-trade-war-a-timeline/>
- Xu, D., & Shenkar, O. (2002). Institutional distance and the multinational enterprise. *Academy of Management Review*, 27(4), 608-618.
- Yen, D. A., & Abosag, I. (2016). Localization in China: How guanxi moderates Sino-US business relationships. *Journal of Business Research*, 69(12), 5724-5734.
- Yen, D. A., Abosag, I., Huang, Y., & Nguyen, B. (2017). Guanxi GRX (ganqing, renqing, xinren) and conflict management in Sino-US business relationships. *Industrial Marketing Management*, 66, 103-114.
- Yen, D. A., Barnes, B. R., & Wang, C. L. (2011). The measurement of guanxi: Introducing the GRX scale. *Industrial Marketing Management*, 40(1), 97-108.
- Yuan, Y., Liu, Y., & Wei, G. (2017). Exploring inter-country connection in mass media: A case study of China. *Computers, Environment and Urban Systems*, 62, 86-96.
- Zelner, B. A., Henisz, W. J., & Holburn, G. L. (2009). Contentious implementation and retrenchment in neoliberal policy reform: The global electric power industry, 1989-2001. *Administrative Science Quarterly*, 54(3), 379-412.
- Zhang, Y., Tsang, D., & Fuschi, D. L. (2020a). Chinese multinationals on the new silk route: Managing political risk by branding the nation. *Thunderbird International Business Review*, 62(3), 291-303.
- Zhang, J. Z., & Watson IV, G. F. (2020). Marketing ecosystem: An outside-in view for sustainable advantage. *Industrial Marketing Management*, 88, 287-304.
- Zhang, Z., Zhang, C., & Chang, J. (2021). The deterrence effect of Guanxi on opportunism: The moderating effects of “three institutional pillars”. *Industrial Marketing Management*, 94, 41-51.
- Zhang, Y., Zhang, M., Li, J., Liu, G., Yang, M. M., & Liu, S. (2020b). A bibliometric review of a decade of research: Big data in business research—Setting a research agenda. *Journal of Business Research*, 131, 374-390.
- Zhou, L., Niu, Y., Wang, V. L., & Tang, K. (2021). Hustle for survival or bustle for revival: Effects of guanxi orientation and order of entry for China's electronic business ventures. *Industrial Marketing Management*, 93(2021), 370-381.
- Zhuang, G., Xi, Y., & Tsang, A. S. (2010). Power, conflict, and cooperation: The impact of guanxi in Chinese marketing channels. *Industrial Marketing Management*, 39(1), 137-149.

**Table 1***Guanxi Keyword Analysis, 2017-2020*

#	Keywords	<u>GRX related</u> (47)	<u>Marketplace/ Industry</u> (18)	<u>Networks</u> (21)	<u>Ethics/ Governance</u> (28)	<u>Relationships</u> (30)	<u>Outcomes</u> (15)	<u>Environmental</u> (21)	<u>Technological</u> (10)	<u>Socio- economic</u> (13)	<u>Geopolitical</u> (28)
1	Academic recruitment	Chinese guanxi	Banks	Business networks	Belief in a just world	B2B	Career success	Asset specificity	Innovation capability	Bedouin culture	Environmental uncertainty
2	Acquaintance marketing	Confucianism	China diamond industry	Guanxi networks	Corporate governance	Business relationships	Corporate performance	Entrepreneurship	Innovation performance	China – social life & customs	Beijing
3	Asset specificity	GRX scale	Chinese business	Guanxi circle	Cronyism	Buyer-supplier exchange	Customer loyalty (2)	International business strategy	Innovations	Citizenship behavior	China (20)
4	Belief in a just world	Guanxi (11)	Chinese firms	Guanxi knot	Erotic capital	Buyer-supplier relationships (2)	Firm performance	International marketing	IT outsourcing	Comparative cultural studies	Emerging economy firms
5	Business negotiation	Five classified relationship	Chinese market	Guanxi web	Ethical guanxi (interpersonal relationships)	Cooperation	Innovation performance	Internationalization	IT systems	Comparative cultural studies	Event-based responses
6	Business networks	Ganqing	Creative entrepreneurs	Interpersonal guanxi	Ethics (2)	Customer centricity	Job performance	Internationalizing SMEs	Research	Expatriates	Indian culture
7	Business relationships	Guanxi (mien-tzu)	Digital entrepreneurship	Latent ties	Formal control	Dependency	Learning outcomes	Job performance	Social media	Gender	Politics
8	Case study	Guanxi performance	Directors	Liability of outsidership	Governance	Enterprise-supplier collaboration	Long-term orientation	Competition	Social media	Human capital	Sino-foreign collaboration institutions
9	China	Guanxi capitalism structure	Higher education	Network of guanxi circles	Governance mechanism (2)	Ethical guanxi (interpersonal relationships)	Organization effectiveness	Compulsory	Social networking technology	Identity-based responses	Sino-foreign collaboration institutions
10	China	Intimacy (2)	High-tech industry	Network	Governance structure	Five classified relationship	Proactive	Formal market institutions	WeChat	Proactive personality	
11	China	Lijie (empathy)	HRM	No access	Guanxi favoritism	Interfirm collaboration	Reflection	Human capital		Psychology safety	

12	China	Reciprocity (2)	Logistics (3)	Social capital (3)	Influence tactics	Interpersonal relationship	Success	Interfirm collaboration		Social control	
13	Guanxi	Regional guanxi orientation	Private companies	Social networks (3)	Justice ethics	Negotiations	Turnover intention	Market rationality		Women at work	
14	Guanxi	Ren (humanity)	Science park	Social ties (2)	Legal enforceability	Performance appraisal	Word-of-mouth	New product development			
15	Guanxi	Renqing (reciprocity) (2)	SMEs	Strong ties	Marketing ethics	Personal relationship		New product development			
16	Guanxi	Trust (2)		Weak ties	Moral self-regulatory mechanism	Product co-development.		Outsourcing			
17	B2B	Xinren (trust) (2)			Opportunism	Relational		Personal sales			
18	Banks				Opportunistic behavior	Relational exchange theory		Personal sales			
19	Bedouin culture				Organizational justice (2)	Relationalism		Private companies			
20	Beijing				Partner opportunism	Relationship building		Product development			
21	Buyer-supplier exchange				Partners' misbehavior	Relationship marketing (3)		Purchase-decision involvement			
22	Buyer-supplier relationships				Silence moral disengagement	Superior-subordinate guanxi (4)					
23	Calculative trust				Supervisor incivility	Transformational leadership					
24	Career success				Task conflict	University partnerships					

**Table 2***GDELT Summary – Guanxi Article Count, 1 Jan 2017-12 Aug 2020*

Query item	Total number of relevant articles	Total number of monitored articles
1 – Guanxi related terms	162,362,557	685,240,859
2 – Guanxi related terms: US	42,882,557	685,319,492
3 – Guanxi related terms: China	16,563,905	685,235,064
4 – Guanxi related terms: Germany	4,220,500	685,325,919

**Table 3***Correlations of News Sentiment between China and the US, China and Germany, and the US and Germany, 1 Jan 2017-12 Aug 2020*

	$\rho$ China, USA	$\rho$ China, Germany	$\rho$ USA, Germany
1H17	0.10	0.20	0.48
2H17	0.12	0.16	0.51
1H18	0.25	0.20	0.18
2H18	0.34	0.15	0.26
1H19	(0.25)	0.08	0.06
2H19	(0.15)	0.01	0.49
1H20 <sup>^</sup>	0.00	0.36	0.40
Total Period	0.11	0.19	0.18

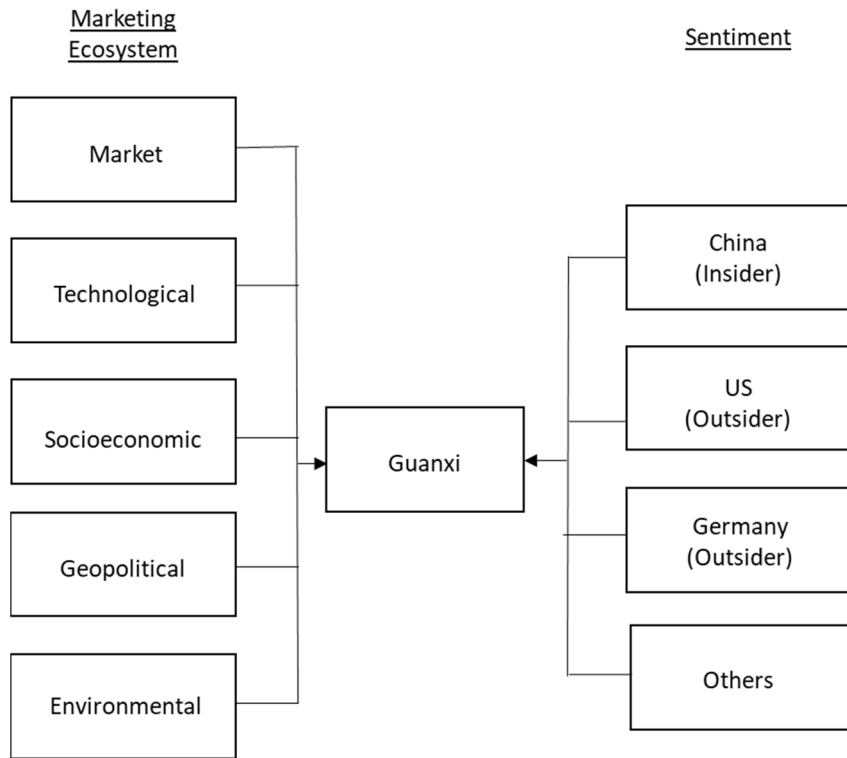
<sup>^</sup>Including Jul-Aug**Table 4***Mean, Variance, and Standard Deviations of News Sentiment between China, the US, and Germany, 1 Jan 2017-12 Aug 2020*

Tone	China	US	Germany
$\mu$	-1.9	-2.38	-2.35
Var	0.22	0.22	0.18
SD	0.47	0.47	0.42

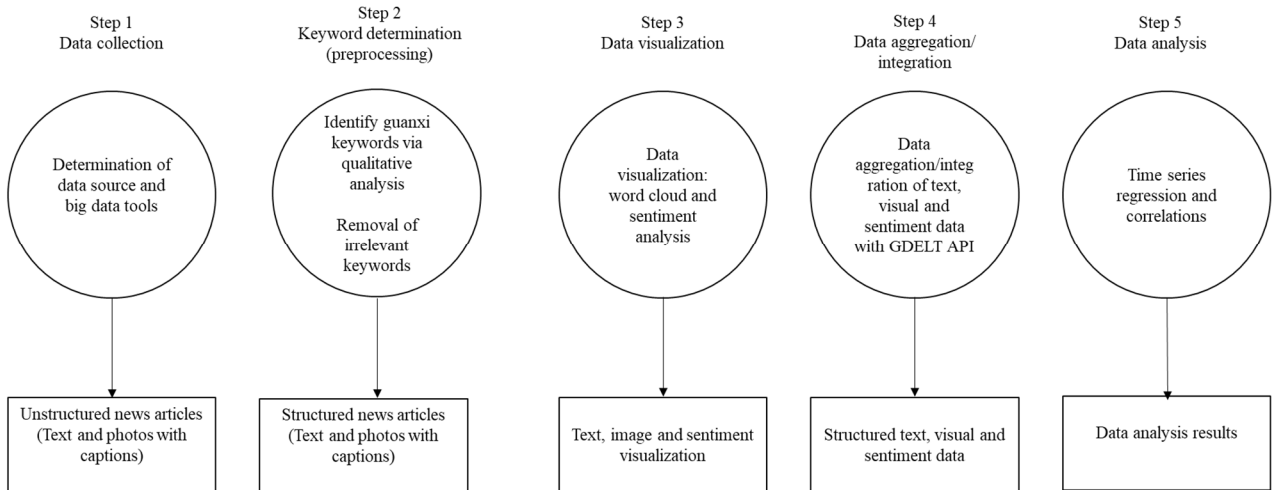
**Table 5**

*Guanxi Relations: An Outside-in View (Insiders vs. Outsiders)*

Geopolitical 2017	Geopolitical 2018	Geopolitical 1H2019	Geopolitical 2H2019	Environmental (1) Jan - Mar 20 (2) Apr - Aug 20
Normal guanxi relations	Negative guanxi relations	Hostile guanxi relations	Hostile guanxi relations	Negative to normal guanxi relations
Stable country relations	US-China trade war	US-China trade war	US-China trade war  Hong Kong student protests	(1) COVID-19 (2) COVID-19 The new norm
US and Germany as related outsider	Germany as unrelated outsider	Germany as unrelated outsider	US and Germany as related outsider	Germany as related outsider with US and insider with China
China as insider	China as insider	China as insider	China as insider	China as insider



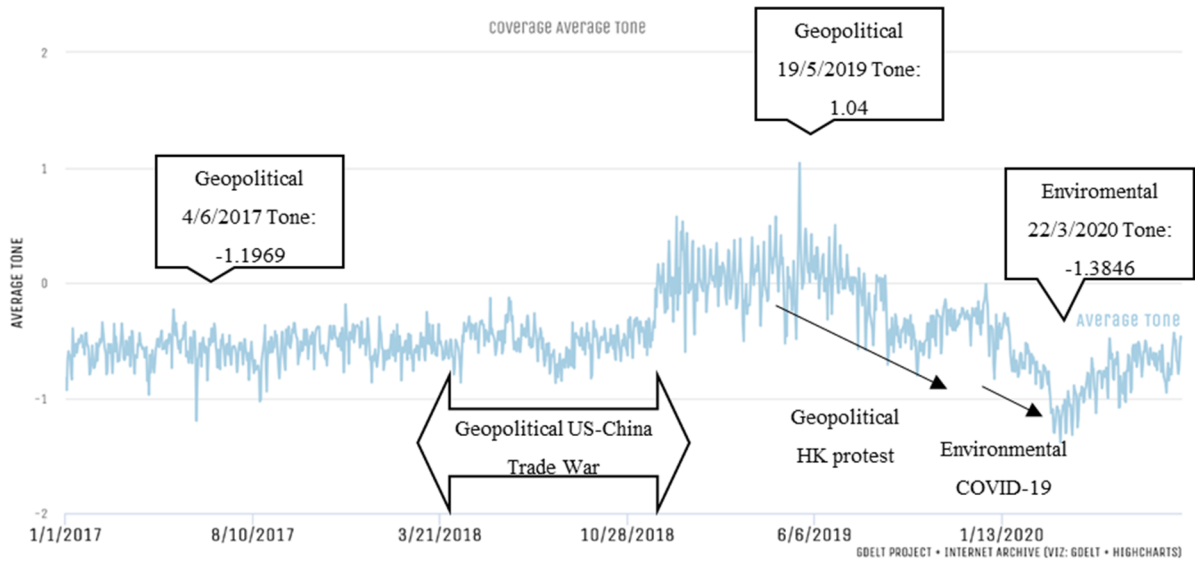
**Figure 1** The “Outside-in” Global Perspective of Guanxi



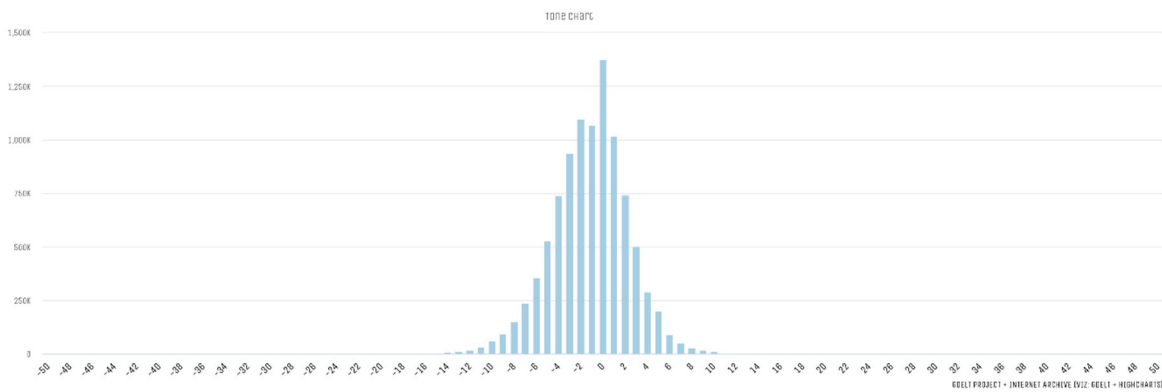
**Figure 2** Operationalization Process







**Figure 5** Average Tone of Guanxi-related Articles, 1 Jan 2017 – 12 Aug 2020



**Figure 6** Tone Bar Chart of Guanxi-related Terms, 1 Jan 2017 – 12 Aug 2020

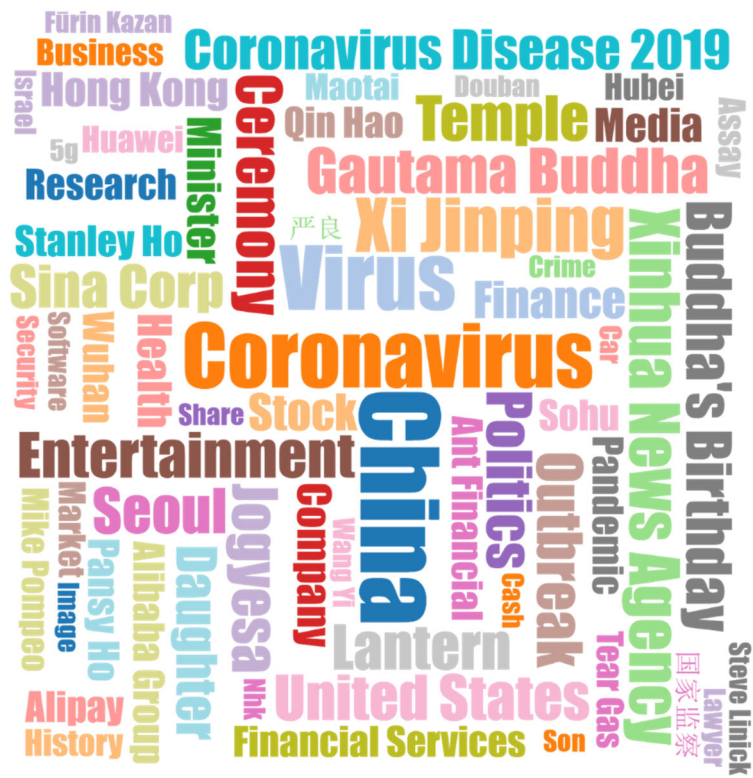


Figure 7 Guanxi Image Tags – Word Cloud (1 Jan 2017 – 12 Aug 2020)



Figure 8 Guanxi Image Topics – Word Cloud (1 Jan 2017 – 12 Aug 2020)



Figure 9 Top Iconic Images from Guanxi Terms

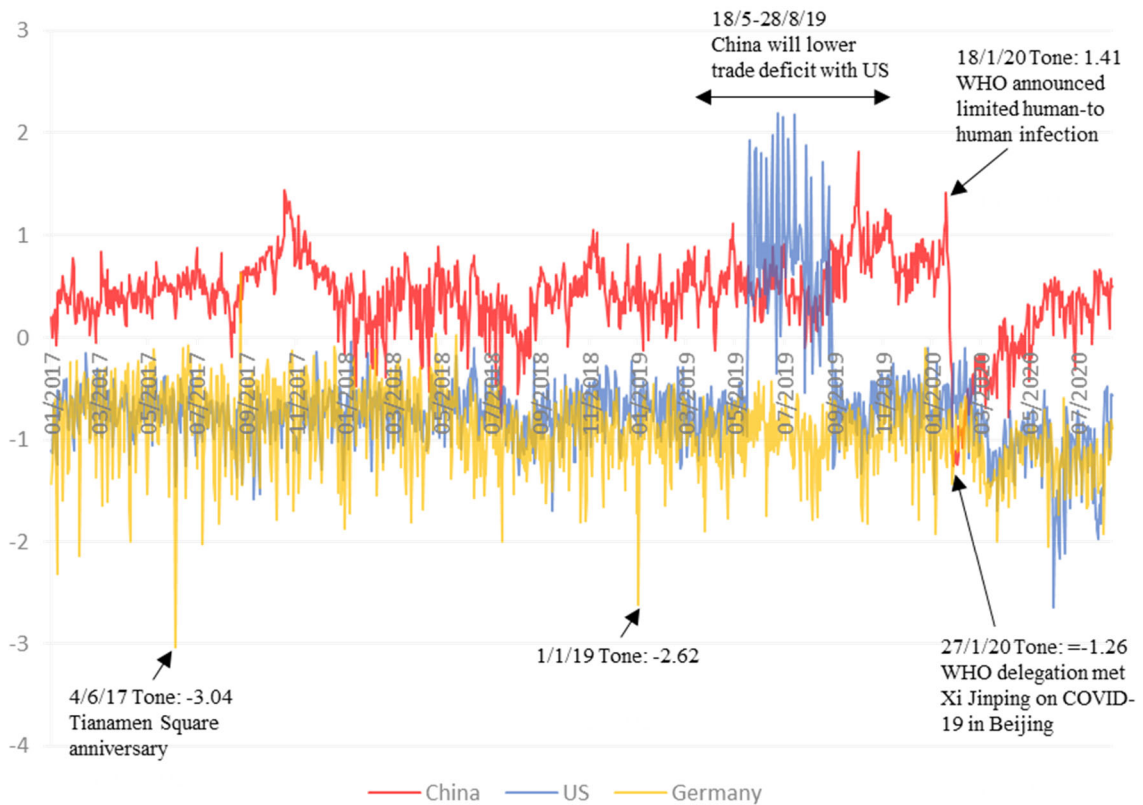
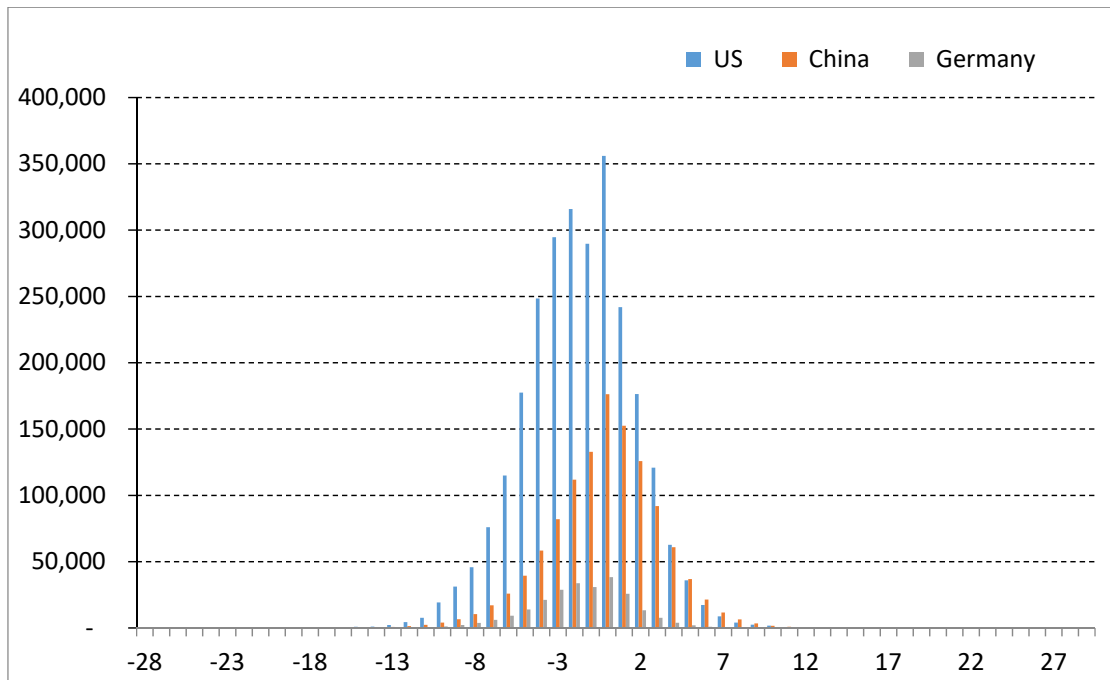


Figure 10 Average Tone Comparison of Guanxi-related Articles Originating from China, the US, and Germany (1 Jan 2017 – 12 Aug 2020)



**Figure 11** *Tone Bar Chart of Guanxi-related Terms and Comparison of Articles between China, the US, and Germany (1 Jan 2017 – 12 Aug 2020)*



**Figure 12** *Guanxi Image Topics – Word Cloud Originating from China (1 Jan 2017 – 12 Aug 2020)*

