Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Appeal of word of mouth: Influences of public opinions and sentiment on ports in corporate choice of import and export trade in the post-COVID-19 era

Kui Yi\textsuperscript{a}, Yi Li\textsuperscript{a}, Jihong Chen\textsuperscript{b,}\textsuperscript{*}, Mengling Yu\textsuperscript{a}, Xi Li\textsuperscript{b}

\textsuperscript{a} School of Economics and Management, East China Jiaotong University, Nanchang, 330013, China
\textsuperscript{b} College of Management, Shenzhen University, Shenzhen, 518061, China

ARTICLE INFO

Keywords:
- Post-COVID-19 era
- Public opinions on ports
- Empathy
- Import and export trade choice
- Word of mouth (WOM)

ABSTRACT

With the advent of the post-COVID-19 era, corporate managers of import and export trade are now more sensitive in their daily work, and their decisions are more likely to be influenced by the emotional bias of public opinions, especially regarding cooperation with trade ports of frequent circulation. Therefore, how to manage public opinion and sentiment in the post-COVID-19 era will be a new opportunity and challenge for the marketing management of ports. For the above considerations, through the same frequency verification between public opinions and sentiment on ports and corporate choice of import and export trade, and through analysis of the influence mechanism, the present study demonstrates the positive effects of public opinions and sentiment on ports in corporate choice of import and export trade in the post-COVID-19 era, verifies the significance of shaping word of mouth in port management, puts forward the great role of public opinions and sentiment in the cognitive and emotional empathy in the choice of import and export trade, and provides theoretical guidance for port managers’ strategic choices in the post-COVID-19 era.

1. Introduction

Ports are crucial infrastructure for the development of international trade and play a great role in supporting the development of maritime transport and trade connectivity. Due to its natural characteristics of large volume of goods, long distance and low freight price, sea transportation has always been an important choice for international trade. The production, supervision and planning and construction of ports are of great significance and continue as the focus of academia (Wan and Chen, 2018; Chen et al., 2020; Menhat et al., 2021). However, due to COVID-19 and global economic downturn, the import and export trade status of ports in various countries has shown varying degrees of decline (Xu et al., 2021a,b). Relevant departments and units of port management have turned their attention to the sustainable operation of ecological chain of port service (Zhao et al., 2021) in a bid to solve the unstable development of market economy caused by COVID-19. How to attract more enterprises to choose ports for import and export business has become the key point in the current academic research, and port marketing management has become the focus in the port management industry and academia in the era of post-COVID-19.

Research shows that there are generally three aspects for to attract enterprises to choose ports for their import and export trade service, namely, attracting the attention of corporate decision makers, moving the hearts of corporate decision makers, and prompting decision makers to think that choosing the port is conducive to their own economic benefits (Xu et al., 2021a,b). Therefore, port management in the new era should focus on the decision makers of corporate import and export trade and change their willingness to buy services through scientific and effective methods. However, the occurrence of COVID-19 has changed the marketing ecosystem, and traditional face-to-face marketing methods are no longer appropriate (Aharon and Siev, 2021), and decision makers of corporate import and export trade are more likely to trust the online information they browse, and the effects of public opinion formed by online news and related evaluation are gradually emerging on the choice of corporate import and export trade (Nguyen et al., 2021; Smedley, 2021). The COVID-19 has accelerated the application of the Internet in corporate marketing. Under the threat of infectious diseases, ports have shifted their marketing competition onto the Internet, and

\textsuperscript{*} Corresponding author.
E-mail addresses: 3005@ecjtu.edu.cn (K. Yi), LYECJFTU@163.com (Y. Li), jihongchen@szu.edu.cn (J. Chen), YMLDL1021@163.com (M. Yu), sisi9213@yahoo.co.jp (X. Li).

https://doi.org/10.1016/j.ocecoaman.2022.106239
Received 7 February 2022; Received in revised form 14 April 2022; Accepted 17 May 2022
Available online 1 June 2022
0964-5691/© 2022 Elsevier Ltd. All rights reserved.
competition in online public opinions becomes particularly important in the post-COVID-19 era (Zhang et al., 2021). Thus, port marketing management should focus on implementing effective management strategies of online public opinions and sentiment to impress corporate decision makers in making the choice of import and export trade.

As social media develop continuously, online public opinions have played a decisive role in people’s life, and trends in online public opinions have directly influenced people’s immediate cognition and long-term emotional changes (Chen et al., 2022; Yi et al., 2021a; Zhang et al., 2020). Academia assumes this kind of rules as the cognitive empathy and emotional resonance of information ontology, that is, to understand the regular changes of public opinions and sentiment from the perspective of empathy (Yi et al., 2021b; Wang and Yi, 2020). It is significantly reasonable and effective to control the public opinions and sentiment on ports in the post-COVID-19 era through empathy in a multidimensional manner.

Emotional management of online public opinions can be considered as an important component of WOM management, which is a way for firms and policymaker to guide and control people’s emotions in the process of consumption. Literature in WOM mainly focused on the category of enterprise management and consumer responses (Craciun et al., 2020; Li and Katsumata, 2020; Li et al., 2021a, 2021b). In the current era of online media, WOM management has transformed into an online form and has become an important source of information for current consumer purchasing decisions and corporate marketing (De Keyzer et al., 2019; Balan U and Mathew, 2021; Wang et al., 2020). How to effectively manage online WOM has become a common concern for both academics and industry. From the perspective of information dissemination, the information value of online WOM is mainly affected by key characteristics such as information, information source, information sink, and channel, which has been discussed in many existing studies. How to guide the content in WOM, increase the number of WOM, and reduce negative topics through such methods as increasing WOM influence and cultivating opinion leaders have become key issues for research in all walks of life in the internet era (Shukla et al., 2021; Wang et al., 2021). And how to enhance the attractiveness of WOM is one of the most important, which is a direct reflection of the main indicators in the effectiveness of organization unit management. With the shift in the focus of port management in the post-COVID-19 era, how to improve the attractiveness of WOM is becoming an important issue.

On the other hand, it is worth noting that while the focus of port management is shifting in the post-COVID-19 era, managers are becoming more sensitive to their daily working environment, and whether infection will occur in the course of business and operation has become an inevitable concern for managers. At this time, the guidance effectiveness of WOM will be further improved. Managers may exclude the influence of economic effects, prioritize personal health among the main influencing factors of trade choices, and gain a sense of security by paying attention to the situation of public opinions (Duan et al., 2022). This phenomenon further deepens the influence of public opinions in the choice of import and export trade of enterprises. Research on the impact of public sentiment on ports in the choice of enterprises’ import and export trade in the post-COVID-19 era will have important era significance.

Nowadays, related studies on emotional management of online public opinions or WOM management usually focus on the representation of public opinion events, that is, the analysis of relevant news reports and textual materials to uncover people’s perceptions and emotions about public opinions (Kim et al., 2018; Kim and Na, 2021). This method focuses on the in-depth analysis of people’s discourse, and lacks the inclusion of human emotional elements. Most of the time, people’s choices often depend on the emotional changes caused by public opinions. This mechanism is an important question that is difficult to answer through text analysis. Based on this, studies tend to use the quasi-natural experimental model as a tool to represent people’s random understanding and conduct analysis of text content, which is more convenient in exploring the meaning and value behind related Internet news and comments as it excludes other environmental factors. The research method in this study is implemented based on the logical application of social cognitive theory (Bandura and Walters, 1977; Mühlhoff, 2015), which has certain scientific significance. At the same time, on this basis, this paper will also carry out the causal verification of the internal mechanism, in order to analyze the emotional impact mechanism in port management and decision-making more deeply. The combination of the two types of research methods will bring innovative ideas to the research on the impact of public sentiment on ports in corporate import and export trade choices in the post-COVID-19 era.

2. Literature review

2.1. Port management

Previous research on port management has generally focused on three aspects: environmental management, traffic management and management of disease prevention and control. In terms of environmental management, the climate factor is most often considered, and climate change is thought to be a potential threat to port operations which may result in port closures and consequent economic losses (Jian et al., 2019; Izaguirre et al., 2021), as many studies have clearly explained the damage of climate adaptation to port ecology (Puig et al., 2022) and its impact on management costs (Yang et al., 2018). In terms of traffic management, research has generally focused on the relationship between market demand and port congestion, committed to exploring the internal mechanism to achieve the balance between investment and operation (Chen and Liu, 2016), and sorting out the key issues for the sustainable development and continuation of global transport chain (Bellsolà et al., 2019). Therefore, the academia believes that ports’ traffic management should consolidate infrastructure, solve port congestion in a planned way, increase throughput, and balance competitive operation, cost and efficiency (Neagoe et al., 2021). In terms of management of disease prevention and control, a large number of studies have emerged after the breakout of COVID-19, including the management of human evacuation at ports (Gul, 2020), the management of isolation and disinfection on cruise ships (Liu and Chang, 2020) and the construction of health system (Egülüz et al., 2020).

Port management reflects the characteristics of an integrated ecosystem (García-Onetti et al., 2021), mainly devoted to analyzing the conflicts between natural environment and humankind, social environment and humankind, and public environment and humankind in the governance and management measures (Cadoret, 2021). Hence, environmental assessment and environmental governance are the mainstream directions of previous research, and there have emerged numerous studies on the application of various management and measurement methods, route planning and design, which have been thoroughly studied and sorted out (Jofré-Briceno et al., 2021; Aghalari et al., 2021; Poërot et al., 2021). However, with the advent of the post-COVID-19 era, people’s use of the Internet has been further enhanced, and the management of public opinions has become increasingly prominent in port management.

2.2. Public opinion, sentiment and WOM

Public opinion is a vane expressing people’s emotions, which reflects public views on events (Krittananwong et al., 2021), shows the consumers’ cognition of products (Ramsingh and Bhuvaneswari, 2018; Liu et al., 2022), and determines the managers’ preference for decision making (Tan and Guan, 2021; Meng et al., 2021; Chen et al., 2022). Public opinions exist in every aspect of people’s life and affects people’s public behavior, which is an important issue that needs to be addressed in social development. As a result of the global epidemic of COVID-19, there have appeared increasingly rich and diverse studies on the analysis of public sentiment through public opinion texts and the analysis of
social commitment to analyzing more abstract positive, neutral and negative emotional features (Sakti et al., 2021) or emotional manifestations such as discrimination, anger and joy through traditional text analysis or online text analysis to judge whether the public opinion is for or against (Barachi et al., 2021). However, such research is obviously not deep enough to explore the in-depth emotional connotations and the wide perspectives in public opinions. There has also emerged a trend of replacing text content analysis through machine learning methods (A Rahim et al., 2021) and video content analysis (Southwick et al., 2021).

As it has gradually become a consensus that public opinions can cause emotional changes, it is further discovered in the academia that the triggered emotion often leads to changes in behavior (Lee et al., 2022). Such mechanism where emotions cause behavioral changes generally exists not only in simple personal characteristics, but also more prominently in the law of mass communication among the public.

At present, a large number of scholars have summed it up as the generation and role of WOM, which can be in the form of online comments and expression of public opinions and sentiment (Li et al., 2022), public opinions and emotional touch on product and service quality (Lin et al., 2021), public opinions and emotional touch on business commodity consumption (Sun et al., 2021; Lim and Zhang, 2021), public opinions and sentiment enthusiasm for the experience of tourist destinations (Schoner-Schatz et al., 2021), and public opinions and sentiment on the recognition of corporate image (Markovic et al., 2021; Nian et al., 2021).

Under the evolution of “stimulus-organic-response” (Cheng et al., 2021), behavioral motivation is gradually strengthened (Wang et al., 2021). In general, WOM has been abstractly considered as a social “connection” to shorten the physical distance (Todri et al., 2021), which can not only achieve the viral marketing path of enterprises (Donthu et al., 2021), but also effectively enhance the instant experience of consumers or audiences (Chao et al., 2021). However, it should be noted that WOM does not have a consistent positive effect on behavior, and the understanding of WOM by different individuals or different groups is generally mixed with the coexistence of positive and negative aspects (Talwar et al., 2021). Studies show that there is a close causal relationship among public opinions and sentiment and WOM (Quach et al., 2021).

2.3. Economic and management studies in import and export trade

Studies on export trade mostly touch upon two aspects: economic development and corporate management. The research on the law of economic development generally focuses on the relationship between import and export commodities or services and regional economic development (Sokolov-Mladenovic et al., 2016), the verification of export and import of unit price and terms of trade index of customs authorities (Silver, 2009), econometric law of international trade, energy consumption and carbon dioxide emissions (Al-Mulali and Sheau-Ting, 2014), and input-output ratio of import and export trade of water resources (Chen et al., 2018). The research interprets the relationship between various index coefficients of import and export trade and economic development, ecological environment and resources, and highlights the influence of import and export trade on the all-round economic development of a region and a country.

The research on enterprise management is done primarily from the perspective of multi-subjects. For instance, from the perspective of enterprises, studies have been carried out on how international trade activities can affect enterprises through exchange rate risks (Cauwenberge et al., 2021; Zhang et al., 2020), analyzed the role of managers in international trade and investment (Ding et al., 2021), and explored the influences of production on trade balance and foreign direct investment (Akhshabiri et al., 2020). From the perspective of industrial sectors, scholars have studied the influences of international trade on the prevalence of regional product consumption (Immura et al., 2021), the classification of transactions in foreign exchange market (Frommel et al., 2021; Peng and Lee, 2021), the interrelationship between ICT connectivity and penetration, trade openness, foreign direct investment and economic growth (Arvin et al., 2021), the influences of foreign direct investment growth on the development of regional service economy (Shenkar et al., 2021), the influences of foreign trade on industrial energy efficiency (Zhao and Lin, 2020). From the perspective of localities, relevant studies have analyzed the balancing mechanism between resource consumption and resource in foreign trade (Kan et al., 2021), and the impact of trade participation on the improvement of regional productivity (Belderbos et al., 2021). From more global perspectives, some scholars have also discussed the impacts of policy preferences on global trade (Peterson, 2021), compared the studies on the impacts of international trade on carbon dioxide emissions between developed and developing countries (Essandoh et al., 2020), and examined the coordination planning of international hubs and feeder ports (Wan et al., 2020).

Current studies on export trade have explored the effects and mechanisms of many kinds of factors, and found that the export volume of foreign trade is characterized by randomness, complexity and strong nonlinearity (Han et al., 2021), and that relevant policies of various regions and countries significantly affect the generation of economic benefits of import and export trade (Knittel et al., 2020). With the continuous advancement of economic globalization, studies on the impacts of import and export trade will continue to be a hot topic in the academia.

To sum up, from studies on port management, public opinions, sentiment and WOM, as well as existing literature related to import and export trade, it can be seen that current research tends to explore natural science and focuses on analyzing issues related to port infrastructure and public events, while paying little attention to the powerful stakeholders. However, in the post-COVID-19 era, risks continue to intensify, and managers of all sectors and departments begin to attach importance to the value of public opinions on the Internet. With the decline of global import and export trade, the goal of port management in the form of love is gradually presented, that is, to build a good reputation to cope with the unfavorable situation of import and export trade in the post-COVID-19 era. Therefore, it is of great significance to study whether there is any correlation between public opinions and sentiment and corporate choice of import and export trade and how public opinion and sentiment affects corporate choice of import and export trade.

As COVID-19 continues to ferment, people’s emotions in the post-pandemic era are becoming more acute, which affects people’s traditional management decisions. Based on this, to solve the emerging topic given by the practical situation and research background, this paper verifies the law of the same frequency resonance between public opinions and sentiment and corporate choice of import and export trade through two sub-studies and puts forward and empirically demonstrates the influence mechanism of public opinion and sentiment on ports in corporate choice of import and export trade. In sub-study 1, through an experimental survey of emotional feedback of import and export entrepreneurs when they read information regarding public opinions on ports and an experimental survey of willingness to choose import and export trade, we have compared the fluctuation rules of the two surveys at the reading nodes, and analyzed and verified whether there existed the same frequency resonance relationship between public opinions and sentiment and corporate choice of import and export trade. In sub-study 2, we have further analyzed the mechanism and empirical evidence of such same frequency resonance relationship and tested the service purchase behavior triggered by corporate managers’ empathy. The combination of these two sub-studies provides a new directional inspiration for port management in the post-COVID-19 era.
3. Sub-study 1: public opinion and sentiment on ports and corporate choice

3.1. Objectives

This sub-study has three main objectives. First, we hope to measure the emotional changes of corporate managers when they read public opinions related to ports through quasi-natural experiments. We regard the law of emotional changes as the degree of constant fluctuation with the progress of reading, so we mainly observe the evolution process of the reading of public opinions, emotional evaluation and expression. On the one hand, numerical sequence marking is carried out on the narrative logic of public opinions. For example, if a message has 45 words, the reading sequence of this public opinion is 45 nodes. On the other hand, the 35 surveyed managers will mark emotional nodes on the public opinion materials according to the generation process of emotions and the information sequence, and record their emotional degrees. Based on this, we record, draw and compare the emotional changes of corporate managers when they read public opinions related to ports. Secondly, we use the same quasi-natural experiment method mentioned above to measure the regularity of changes related to the corporate managers’ intention of import and export choice when they read public opinions on ports. We regard the regularity of changes of the intention of choice as the degree of fluctuation with the progress of reading, so we mainly observe the evolution process of the reading of public opinions and evaluation of intention of choice. On the one hand, we retain the above-mentioned word sequence marking method of narrative logic of public opinions to showcase the reading route of public opinions; On the other hand, the 35 surveyed managers will mark the nodes of willingness on the public opinion materials according to the generation process of the willingness to choose and the word sequence and record the degree of willingness. Based on this, we record, draw and compare the changes in the willingness of corporate managers’ choice of import and export trade when reading public opinions related to ports. Finally, through the achievement of the first two objectives, we compare the two results to verify our previous hypothesis, that is, to verify that there exist resonance properties between the emotional changes of the corporate managers in charge of the choice of import and export trade when reading public opinions and their intentions of import and export choice. Here, we put the results of the above two research objectives together to make an intuitive comparison and use survey interview to sort out the overall presentation of resonance properties.

3.2. Methodology

Participants. 35 managers in charge of import and export trade (Male = 26, female = 9; average age = 44) participated in the study to verify the same frequency law between public opinion and sentiment on ports and corporate choice of import and export trade.

Experimental Materials. The study began with the processing of observational materials. We selected a piece of news related to ports on www.163.com, one of China’s mainstream news websites in the post-pandemic era, titled “Tianjin Port: Building A World-class Smart Port” (which has been given “like” for 41 times, quite prominent in the news related to ports in the same period and closely followed by relevant professionals). Based on relevant evaluation statements, we extracted 45 words from the news as the evaluation materials after discussion.

First Observational Experiment. The subjects were asked to read the observational materials for the first time and make dot marks in accordance with the emotional changes occurring in the reading of the words to record the nodes of emotion in the word sequence. Meanwhile, each time when the emotional occurrence node is marked, the degree of emotional occurrence is scored (5-level scale), which is checked and complemented after reading if there is any omission to record the immediate degree of emotional occurrence in the word sequence.

Second Observational Experiment. The subjects were asked to read the observational materials for the second time and make dot marks in accordance with the intentions of import and export choice occurring in the reading of the words to record the nodes of the intentions in the word sequence. Meanwhile, each time when the occurrence node of intentions is marked, the degree of the intention is scored (5-level scale), which is checked and complemented after reading if there is any omission to record the immediate degree of import and export intentions in the word sequence.

Data Processing and Summary. We summed up the emotional changes occurring in the word sequence when the subjects read the observational materials for the first time and the changes of the intentions of the import and export choice occurring in the word sequence when the subjects read the observational materials for the second time, and then compared the regularities of such changes. After the experiment, the 35 subjects were interviewed, and conclusions were put forward by taking account of the data and interview results.

4. Discussion

Results of Scattered Points. According to the two evaluation scores of the 35 corporate managers in charge of import and export trade, we aggregated and averaged the data, and obtained the following chart of scattered points (as shown in Fig. 1a). The result shows that the scattered points of emotional fluctuation and intention of choice are widely and irregularly distributed. On the other hand, both the emotional fluctuation and the degree of intention of choice are closely distributed, and the difference is generally within 0.5 points.

Evolutionary Trend. The following evolutionary trend diagram (as shown in Fig. 1b) is formed by connecting the scattered points. The result shows that although the evolutionary trend of emotional fluctuation and that of intention of choice fluctuates slightly, both trends generally maintain a rising momentum. On the other hand, except for the slight differences between the evolutionary trend of emotional fluctuation and that of intention of choice at the intervals of 10–20 and 30–40, both trends generally go upward or downward concurrently.

General Discussion. As shown in Fig. 1, on the one hand, as the corporate managers read the public opinions word by word, in the progression of the word sequence, both the emotional fluctuation and intention of choice go upward and witness the peak value in the middle and posterior segment, which reflects people’s emotional and cognitive feedback rules for information reception, and indicates that under the influence of public opinions, WOM has some appeals to people’s emotional changes and the choice of import and export trade. On the other hand, as seen from most of the data features, the corporate managers’ emotional fluctuation and their intentions of choice are close to each other or overlap: if the corporate managers’ emotional fluctuation goes upward, the intention of choice also goes upward; and if the corporate managers’ emotional fluctuation goes downward, the intention of choice of also goes downward. Therefore, there exists a distinct law of same frequency resonance between public opinion and sentiment on ports and corporate choice of import and export trade. To sum up, this study shows that public opinion and sentiment on ports and corporate choice of import and export trade can be regarded as the expression of psychological evolution law of the same frequency, and there may exist a causal relationship between them to some extent.

5. Sub-study 2: public opinions and sentiment on ports in corporate choice

5.1. Objectives

The objective of this sub-study is to further verify the relationship between public opinions and sentiment on ports and corporate choice of import and export trade through the analysis of questionnaire data and to analyze its internal mechanism. The sub-study 1 shows that there exists the law of same frequency resonance between the public opinions...
and sentiment on ports and corporate choice of import and export trade, and the academia has given this law some enlightenment in the existing research. A large number of studies believe that public opinions and sentiment are a complex psychological phenomenon (Naskar et al., 2020; Fu et al., 2020; Sakti et al., 2021), and it is generally regarded as the comprehensive expression of human cognition and emotion, which is currently elaborated with the medical concept of “empathy” by scholars in various fields (Rogers, 1959). Empathy determines behavioral intention, which is manifested as both the rational role of cognition and the perceptual role of emotion. This mechanism has been confirmed by several studies (Atkins et al., 2016; Savenije and De Bruijn, 2017; Kidd, 2019). It should be noted that the scholar Vachon and Lynam (2016) has recently put forward a common phenomenon in the process of empathy, where cognition and emotion do not affect the behavioral

Fig. 1. Ports’ Public Opinion and Sentiment and Corporate Choice of Import and Export Trade
(a) Scatter distribution of character sequence of emotion and intention evaluation
(b) Evolution trend of character sequence of emotion and intention evaluation.
intention directly but through emotional deviation. He has demonstrated a kind of intention deviating from the original intention under the effect of non-empathy, and the proposed deviation has enriched the logical structure of empathy effect on behavioral intention. In view of this, the following hypotheses are put forward. H1: The cognitive empathy of a corporate manager has a positive influence on the emotional deviation. H2: The emotional empathy of a corporate manager has a positive influence on the emotional deviation. H3: The emotional empathy of a corporate manager has a positive influence on the choice of import and export trade. H4: The emotional deviation is a mediating factor in between a corporate manager’s empathy and the choice of import and export trade. Based on these hypotheses, the sub-study carried out empirical analysis and demonstration through the 117 effective samples of corporate managers (a total of 128 managers were surveyed, among which 117 samples were regarded as valid), and put forward a deeper research conclusion by taking account of the mathematical results.

5.2. Methodology

Sample Selection. This sub-study selected corporate managers of port-based import and export trade for a questionnaire survey. After a reasonable proportion of the samples, 128 enterprise managers were selected for an undifferentiated questionnaire survey. A total of 117 valid questionnaires were collected with an effective recovery rate of 91.40%. Specifically, in terms of personal features of the respondents, they were between 35 and 45 years old, and they were all transportation business managers with rich experience in selecting import and export trade, including 82 males and 35 females, 48 general managers and 69 business managers. In terms of corporate characteristics, there were 57 small enterprises, 49 medium-sized enterprises, 11 large enterprises; 84 industrial products trading enterprises and 33 agricultural products trading enterprises; or 13 enterprises in Dalian, 72 in Shanghai, and 32 in Fuzhou.

Research Method. We selected the snowball sampling method for questionnaire survey and adopted PLS-SEM model analysis as an adaptive method for small sample analysis in this paper. Compared with CB-SEM in the traditional sense, PLS-SEM is more suitable for problems such as small sample number, non-normal distribution of data, testing of theoretical framework from the perspective of prediction, including one or more formative models in the model, etc. Besides, it can effectively overcome the collinearity problem between observed variables and the influence of regressive useless noise (Sarstedt et al., 2020; Yi et al., 2020). Therefore, Smart PLS 3.3 software was used in this study to conduct PLS-SEM modeling for the survey data.

Scale Selection. Through the analysis of research objectives, the characteristics of ports and emotions involved in this paper can be measured by the ACME scale proposed by Vachon and Lynam (2016), which is significantly superior to other empathy transmission measurement scales in terms of measuring goodness and accuracy, and the factors of emotional deviation proposed in this scale can better facilitate the analysis of this research topic. On the other hand, for the measurement of corporate choice of import and export trade, based on the research of WOM in marketing, this study selected the classic scale of consumers’ purchase intention, which is fair in the field of consumer behavior research, as the measurement scale (Parasuraman et al., 1988).

In line with the requirements of each scale, the scale for empirical analysis in this paper is shown in Table 1.

| Table 1 |
|---|
| Scale selection and item composition. |
| Scales | Items’ tags | Measurement question items |
| Cognitive empathy of public opinion | YR1 | It is difficult for you to understand the content of the public opinion related to the ports |
| | YR2 | You can judge the actual situation of the port business according to the information of the public opinion |
| | YR3 | You can have some knowledge of port operation through the evolution of public opinions |
| | YR4 | You can distinguish the severity of the event through public opinions |
| | YR5 | You can usually judge a port from your past experience |
| Emotional empathy of public opinion | YQ1 | The positive public opinion of commercial ports can make you more assured to choose them as the partner |
| | YQ2 | You can enjoy learning about the advantages of your target port through multiple channels |
| | YQ3 | The poor history of port operations makes you worry about the level of its operations |
| | YQ4 | The port’s public opinions will not affect your loyalty |
| | YQ5 | When choosing port service providers, you will make judgments based on emotional inclinations |
| Emotional deviation of public opinion | YG1 | You think it is meaningful to select the port for the shipping service through a variety of information |
| | YG2 | You like to read negative information about cooperative ports to avoid risks |
| | YG3 | You do not want to see the negative public opinion of the cooperative port |
| | YG4 | The full range of port services worries you |
| | YG5 | You’ll think your peers’ decisions are stupid |
| | YG6 | You don’t want your competitors to see through your choosing reasons |
| | YG7 | Sometimes you feel that ports’ public opinion will have an impact on the industrial field you are engaged in |
| | YG8 | You think that if the cooperative port can get rid of the negative public opinion, it will greatly improve the efficiency |
| | YG9 | You are happy to see the public opinion supervision of news media on the shipping ports |
| Service purchase choice | FG1 | Advanced port equipment will give you confidence in the port’s business capabilities |
| | FG2 | You think that the port with high throughput can complete the cargo transshipment timely within the promised time |
| | FG3 | You think the physical facilities of the port are consistent with the type of services provided |
| | FG4 | You think the port you choose based on your business experience is stable and reliable |
| | FG5 | The meticulous attitude of the port staff will please you |

5.3. Discussion

Data Analysis Results. The following aspects can be seen from the PLS-SEM analysis results (as shown in Fig. 2). First, the characteristic values of the first principal component in each dimension are all greater than 1, while those of the other principal components are all less than 1. All dimensions have passed the test. Second, standardized results were used for analysis. As for the service purchase option, Cronbach’s Alpha is 0.931, rho_A, 0.938, combination reliability, 0.948, and AVE, 0.785. As for the emotional deviation of public opinion, Cronbach’s Alpha is 0.954, rho_A, 0.958, combination reliability, 0.961, and AVE, 0.733. As for the emotional empathy of public opinions, Cronbach’s Alpha is 0.934, rho_A, 0.937, combination reliability, 0.950, and AVE, 0.790. As for the cognitive empathy of public opinion, Cronbach’s Alpha is 0.921, rho_A, 0.922, combined reliability, 0.940, and AVE, 0.759. The overall fitting effect of the model is good, and the interpretation effect of the internal potential relationship is significant. In addition, the estimated effect is acceptable, and all the reliability index is in agreement with the structural validity. Third, the R² value of service purchase choice during model checking is 0.533, and the adjusted R² value is 0.529, indicating that each latent variable has a relatively good ability to explain service
purchase choice. The coefficients of Cronbach’s Alpha of all latent variables are greater than 0.7, indicating that all latent variables have good reliability. The combination reliability (CR) of each potential variable is greater than 0.7, which further proves the high reliability of the model. The AVE and rho_A of each latent variable are close to or greater than 0.7, reaching the relevant statistical standards. Q² is a statistic that evaluates the influence of exogenous variables on endogenous variables. Q² is greater than 0.35, indicating that exogenous variables have a higher influence on endogenous variables, that is, the prediction correlation of the model is stronger. The Q² value of service purchase choice in the model is 0.404, indicating that the exogenous variables of this model have a strong prediction correlation with the endogenous variable. In other words, it means that at the comprehensive development level, the overall prediction ability of PLS model is moderate (Hair et al., 2019). Fourth, the HTMT values of the Fournel-Pull criterion were used for measurement. Based on a large number of social empirical studies, Voorhees and Henseler believed that researchers could check the upper limit of 95% confidence interval of HTMT to conduct discriminative validity test for the relationship of measurement model dimensions, that is, to verify whether the upper limit of HTMT is lower than 0.9 or 0.85. In view of this, the results of discriminative validity test of the model dimensions of the four measurement variables in the proposed model of this study are as follows: the discriminative validity between the emotional deviation of public opinions and service purchase choice is 0.766; the discriminative validity between the emotional empathy of public opinions and service purchase choice, 0.618; the discriminative validity between the cognitive empathy of public opinions and service purchase choice, 0.748; the discriminative validity between the emotional empathy of public opinion and emotional deviation of public opinions, 0.629, the discriminative validity between the cognitive empathy of the public opinion and emotional deviation of public opinion, 0.764; and the discriminative validity between the cognitive empathy of public opinion and emotional empathy of public opinions, 0.527. The HTMT values of the related dimensions involved in the test are all lower than 0.85, indicating that the reflective measurement of the proposed model has good discriminative validity. Fifth, the Bootstrapping method is used to calculate the T statistics of each path coefficient, and the specific parameters to test the significance level of the path coefficient estimation (two-tail test) are shown in Table 2. The path coefficient was estimated to be significant at 0.05 level when 2.58 > T > 1.96, at 0.01 level when 3.29 > T > 2.58, and at 0.001 level when T > 3.29. The T statistics of structural equation model in Bootstrapping test show that all path coefficients have high T statistics, and P values of each path are all less than 0.05, indicating that each path coefficient has
passed the test of corresponding significance level, and the model structure has good stability (Streukens and Leroi-Werelds, 2016). To further verify the influence mechanism of public opinions and sentiment on ports in corporate choice of import and export trade, the Bootstrapping method is used to verify the path coefficient of specific indirect effects, and the result proves the specific indirect effects in the model which have a good performance.

**Performance Results of the Model.** The H1, H2, H3 and H4 hypotheses have been verified in this study. First, enterprise managers’ cognitive empathy exerts a positive impact on emotional deviation, and the path coefficient is 0.559, indicating that even rational managers are prone to have emotional deviation. In the post-COVID-19 era, people tend to increase their inherent cognition when reading and understanding public opinions, that is, to understand public opinions with awe to the global pandemic environment, and the cognitive difference caused by the awe to the pandemic environment is manifested as the emotional deviation in cognition. Second, corporate managers’ emotional empathy exerts a positive impact on emotional deviation, and the path coefficient is 0.326. Although emotional irrationality is still an important factor for emotional deviation, its effect is slightly lower than the cognitive effect which fully reflects the immediate performance of a rational view of the pandemic environmental impacts. Third, corporate managers’ emotional deviation exerts a positive impact on their choice of import and export trade and the path coefficient is 0.730. As shown in the scale design, the emotional deviation of public opinions on ports in the post-COVID-19 era emphasize more public opinion events while neglecting the choice of export trade, which is a manifestation of the emotional connection between two independent objects of concern. Combined with the empirical results, there is a significant connection of the same frequency resonance between the emotion and intention of choice verified in the sub-study 1. Fourth, emotional deviation is the intermediary factor between corporate managers’ empathy and choice of import and export trade. The verification of the intermediary effect proves that the deviation of emotion affects the people’s rational and emotional psychology, which can greatly improve or reduce the willingness effect of the two on corporate choice of export trade. Therefore, the grasp of emotional deviation should be the key to port marketing management and WOM shaping in the post-COVID-19 era.

6. **Conclusion and prospect**

6.1. **General Discussion**

Port management in the post-COVID-19 era needs to urgently create WOM with more emotional deviation value. The results of our study show that corporate choice of import and export trade in the post-COVID-19 era is prone to public opinions. When relevant managers read public opinions, they will have emotional fluctuations that, though seems to be an insignificant moment in life, will be the key to determining the development of import and export trade of the port.

The two sub-studies have demonstrated our viewpoint in a logical and progressive way. First, when the corporate managers in charge of the decision-making of import and export trade read the information of public opinions, their emotion resonates at the same frequency with their immediately generated trade choices (sub-study 1). This is a validation process of a natural phenomenon existing in the post-COVID-19 era, and also responds to the first question presented in this study (to verify the same frequency resonance law between public opinions and sentiment and corporate choice of import and export trade to proves that the emotion of corporate decision makers reading public opinions will exert a positive import on the export trade choice of enterprises). Second, when corporate managers in charge of the decision-making of import and export trade read the information of public opinions, the rational and emotional expression of cognitive empathy and emotional empathy will comprehensively influence the emotional deviation deeply rooted in the final judgment (sub-study 2). The conclusions describe the causal connection between two intuitively unrelated elements, namely, the positive influence of public opinions and sentiment in corporate choice of import and export trade, and respond to the second question presented in this study (to demonstrate the influence mechanism of public opinions and sentiment on ports in corporate choice of import and export trade, to sort out the complex transmission problems of public opinions so as to explore the direction for managing public opinions and sentiment, and even to facilitate the overall planning and decision-making in the post-COVID-19 era). Finally, the study has generally showed a path and means for managing public opinions and sentiment on ports in the post-COVID-19 era, that is, strengthening the appeal of the port itself the import and export enterprises (sub-study 1 and sub-study 2), and it has pointed out a feasible path for the operation and development of port managers in the new era.

Overall, this research is still exploratory in terms of port management issues, but it is a new attempt from three aspects. From the first aspect, it combines the regular characteristics of communication studies and fits the current academic development form of interdisciplinary integration. From the second aspect, this research selects news text and decision-making in the post-COVID-19 era. From the third aspect, the research method is an improvement of traditional text analysis methods, which replaces the previous qualitative evaluation standards with more objective degree evaluation standards. Overall, this study expands the research perspective of port management, analyzes the problems of port management in the new era, and innovates the research methodology.

6.2. **Theoretical implications**

Theoretically, the significance of this research is as follows. First, it has broadened the understanding of WOM in marketing literatures. In

---

**Table 2**

Significance test results of path coefficients.

| Path                                              | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T Statistic (IO/STDEV) | P Value |
|---------------------------------------------------|---------------------|-----------------|---------------------------|------------------------|---------|
| Emotional deviation of public opinion > service purchase choice | 0.730               | 0.730           | 0.058                     | 12.658                 | 0.000   |
| Emotional empathy of public opinion > emotional deviation of public opinion | 0.326               | 0.318           | 0.088                     | 3.695                  | 0.000   |
| Cognitive empathy of public opinion > emotional deviation of public opinion | 0.559               | 0.565           | 0.081                     | 6.863                  | 0.000   |
| Cognitive empathy of public opinion > emotional deviation of public opinion > service purchase choice | 0.408               | 0.413           | 0.071                     | 5.752                  | 0.000   |
| Emotional empathy of public opinion > emotional deviation of public opinion > service purchase choice | 0.238               | 0.234           | 0.072                     | 3.322                  | 0.001   |
previous studies, WOM is mostly used to explore the law of form transformation from passive marketing to active marketing with an aim to put forward a publicity path for the characteristic products (Bao et al., 2019), which is a kind of application of enterprise marketing strategy with potential consumer targets. However, the present study emphasizes a broader marketing and communication mode, that is, a marketing mode with the guidance of public opinion bias as the goal and targeting more people. This study also highlights the new direction of WOM marketing objects and goals in the fragmented information era. Under the guidance of such research philosophy, based on continuing the attention of consumer psychology and business value improvement (Lisjak et al., 2021), the present study has extended the application scope of WOM marketing to the port operation work, adding to this under-researched field and expanding applicable subjects of the WOM in marketing literatures.

Second, the present study has strengthened research on the international trade theory from the micro perspectives. Most similar previous studies had focused on the existence of the reciprocal demand theory and explained the trade interactions between different countries and regions from a rational perspective (Zhu et al., 2021; Smith and Sarabi, 2022), while the present study has made a bold assumption that the emergence of trade is sometimes determined by the corporate managers in charge of import and export trade, and it has demonstrated the significance of management willingness interwoven with rationality and emotion in the port trade.

Besides, the present study has verified the application significance of empathy theory in management science through the analysis of empathy with public opinions and sentiment on ports and corporate choice of import and export trade in the post-COVID-19 era. It has used the ACME scale proposed by Vachon (Vachon and Lynam, 2016), and the dual-process path of cognitive and emotional empathy (Reniers et al., 2011; Murphy et al., 2020; Wang and Yi, 2020). Based on previous studies, the present study has proposed an empathy framework, that is, an emotional deviation to the public opinions that is independent from the dual process path of cognitive empathy and emotional empathy becomes a more important factor that acts on the rational and emotional understanding of the audience. The present study is a reinforcement of existing studies on empathy, further highlighting the significance and value of emotional deviation.

6.3. Management implications

The findings of this study suggest that port management can be enhanced by three aspects of emotion management in the post-COVID-19 era due to the prevalence of the Internet and the need for the prevention and control of infectious diseases. Firstly, from the perspective of cognitive empathy, enhancing the audience’s public opinion cognition can gain social attention through more online UGC content, such as promoting relevant knowledge on Twitter, Facebook, TikTok and other platforms, which can further eliminate managers’ concern for public opinions. Secondly, from the perspective of emotional empathy path, ports can shape their own images and create emotional brands by combining environmental elements, so that potential customers can be more attracted to such ports for trade transactions. Finally, from the perspective of emotional deviation correction path, a real-time monitoring mechanism should be shaped to find possible negative influences and comments in public opinions, and ports should make things right as soon as possible to eliminate emotional deviation.

In general, the research demonstrates three paths of WOM attraction. Among them, the cognitive empathy path represents the channel shaping of rational thoughts, the emotional empathy path represents the situational construction of perceptual thoughts, and the emotional deviation correction path represents the correction of inevitable management problems. The coordinated implementation of the three will bring port management an advantage in the post-COVID-19 era competition.

6.4. Further research directions

The present study has demonstrated a relevant phenomenon and mechanism related to public opinion and port sentiment on ports and sorted out their related theories and management logic. More underlying laws and regularities need to be further studied, for instance, multi-party exchange and interaction between corporate managers in charge of the choice of import and export trade, releasers of public opinions and recipients of public opinions, and the interplay among the spatial characteristics of the public opinions, the psychological spatial characteristics of the recipients of public opinions and the ports’ physical spatial characteristics. These issues need to be further explored one by one. Also, since the present study has focused on the post-COVID-19 era, the sub-study 1 has chosen experimental data with broader characteristics. Future research can focus on the public opinion materials directly related to COVID-19, and the management problems of public opinion and sentiment on ports during the COVID-19 pandemic is also worth in-depth exploration.

CRediT authorship contribution statement

Kui Yi: Conceptualization, Methodology, Writing – original draft, Data curation, Visualization. Yi Li: Writing – original draft, Data curation, Visualization. Jihong Chen: Methodology, Writing – review & editing, Supervision. Mengling Yu: Formal analysis, Data curation, Visualization, All authors read and approved the final manuscript. Xi Li: Methodology, Writing – review & editing, Supervision.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgement

This study is supported by the funding of Key Project of National Social Science Foundation of China (No. 21AG1014); National Natural Science Foundation of China (No. 72102151, and 71772129); Social Science Planning General Project in Jiangxi Province, No. 21XJG56; Jiangxi Province Culture and Art Science planning general project, No. YG2021087; Jiangxi Province Colleges Humanities and Social Science Project, No. GL20214.

References

Alshubiri, F., Elheddad, M., Doytch, N., 2020. The impact of fish production on marine economies. Mar. Pol. 116 (Jun), 103660.
Al-Mulali, U., Sheau-Ting, L., 2014. Econometric analysis of trade, exports, imports, energy consumption and co2 emission in six regions. Renew. Sustain. Energy Rev. 33 (May), 484-498.
Aldubiri, E., Elheddad, M., Doytch, N., 2020. The impact of fish production on marine trade balance and foreign direct investment: an empirical study of the GCC economies. Mar. Pol. 116 (Jun), 103660.
Arvin, M.B., Pradhan, R.P., Nair, M., 2021. Uncovering interlinks among ICT connectivity and penetration, trade openness, foreign direct investment, and economic growth: the case of the G-20 countries. Telematics Inf. 60 (Jul), 101567.
Atkin, D., Uskul, A.K., Cooper, N.R., 2016. Culture shapes empathic responses to physical and social pain. Emotion 16 (5), 587-601.
Balan U., Mathew, S.K., 2021. Personalize, summarize or let them read? A study on online word of mouth strategies and consumer decision process. Inf. Syst. Front 23 (3), 627-647.
Bandura, A, Walters R H, 1977. Social learning theory. General Learning Press, New York:Prenticehall Englewood Cliffs.
Bao, T., Chang, T.L.S., Kim, A.J., Moon, S.H., 2019. The characteristics and business impact of children’s electronic word of mouth in marketing communications. Int. J. Advert. 38 (5), 731-759.
hospitals using machine learning and Facebook reviews. Int. J. Environ. Res. Publ. Health 18 (10), 9912.

Raminging, J., Bhuvaneshvari, V., 2018. An efficient Map Reduce-Based Hybrid NBC-TFIDF algorithm to mine the public sentiment on diabetes mellitus–A big data approach. J. King Saud Univ. Comput. Inf. Sci. 33 (8), 1018–1029.

Reniers, K.L., Corcoran, R., Drako, R., Shyama, N.M., Vollm, B.A., 2011. The QCAE: a questionnaire of cognitive and affective empathy. J. Pers. Assess. 93 (1), 84–95.

Rogers, C.R., 1959. A theory of therapy, personality, and interpersonal relationships: as developed in the client-centered framework. In: Koch, S. (Ed.), Psychology: A study of science. McGraw-Hill, 3.

Sakti, A.M.T., Mohamad, E., Aclan, A.A., 2021. Mining of opinions on covid-19 large-scale social restrictions in Indonesia: public sentiment and emotion analysis on online media. J. Med. Internet Res. 23 (8), e28249.

Sarstedt, M., Hair Jr., J.F., Nitzl, C., Ringle, C.M., Howard, M.C., 2020. Beyond a tandem analysis of SEM and PROCESS: use of PLS-SEM for mediation analyses. Int. J. Mark. Res. 62 (3), 288–299.

Savenije, G.M., De Bruijn, P., 2017. Historical empathy in a museum: uniting contextualization and emotional engagement. Int. J. Herit. Stud. 23 (9), 832–845.

Schoner-Schatz, L., Hofmann, V., Stokburger-Sauer, N.E., 2021. Destination’s social media communication and emotions: an investigation of visit intentions, word-of-mouth and travelers’ facially expressed emotions. J. Destin. Market. Manag. 22 (Dec), 100661.

Shenkar, O., Liang, G., Shenkar, R., 2021. The last frontier of globalization: trade and foreign direct investment in healthcare. J. Int. Bus. Stud. 17 (May), 1–13.

Shukla, A.D., Gao, G., Agarwal, R., 2021. How digital word-of-mouth affects consumer decision making: evidence from doctor appointment booking. Manag. Sci. 67 (3), 1546–1568.

Silver, M., 2009. Do unit value export, import, and terms-of-trade indices misrepresent price indices? IMF Staff Pap. 56 (2), 297–322.

Smedley, S., 2021. A matter of public importance? The ‘Europe open for business’ campaign, British public opinion and the single market. J. Commun. Media Stud.: J. Common. Media Stud. 59 (4), 929–944.

Smith, M., Sarabi, Y., 2022. How does the behaviour of the core differ from the periphery? An international trade network analysis. Soc. Network. 70, 1–24.

Tan, H., Peng, S.L., Zhu, C.P., You, Z., Miao, M.C., Kuai, S.G., 2021. Long-term effects of the COVID-19 pandemic on public sentiments in Mainland China: sentiment analysis of social media posts. J. Med. Internet Res. 23 (8), e29150.

Tan, M.J., Guan, C., 2021. Are people happier in locations of high property value? Spatial temporal analytics of activity frequency, public sentiment and housing price using twitter data. Appl. Geogr. 132 (July), 102474.

Todri, V., Adamopoulos, P., Andrews, M., 2021. EXPRESS: is distance really dead in the online world? The moderating role of geographical distance on the effectiveness of electronic word-of-mouth. J. Market. 1–23.

Vachon, D.D., Lynam, D.R., 2016. Fixing the problem with empathy: development and validation of the affective and cognitive measure of empathy. Assessment 23 (2), 135–149.

Wan, S., Lu, W., Ma, Y., Haralambides, H., 2020. On determining the hinterlands of China’s foreign trade container ports. J. Transport Geogr. 85 (May), 102725.

Wan, Z., Chen, J., 2018. Human errors are behind most oil-tanker spills. Nature 560 (7717), 161–163.

Wang, C., Yi, K., 2020. Impact of spatial scale of ocean views architecture on tourist experience and empathy mediation based on “SEM-ANP” combined analysis. J. Coast Res. 103, 1125–1129.

Wang, F., Wang, M., Wan, Y., Jin, J., Pan, Y., 2021. The power of social learning: how do observational and word-of-mouth learning influence online consumer decision processes? Inf. Process. Manag. 58 (5), 102632.

Wang, W., Ma, T., Li, J., Zhang, M., 2020. The pauper wears Prada? How debt stress promotes luxury consumption. J. Retailing Consum. Serv. 56, 102144.

Xu, L., Shi, J., Chen, J., Li, L., 2021a. Estimating the effect of COVID-19 epidemic on shipping trade: an empirical analysis using panel data. Mar. Pol. 153 (Nov), 104768.

Xu, L., Yang, S., Liu, B., 2021b. The effect of COVID-19 pandemic on port performance: evidence from China. Ocean Coast Manag. 209 (Aug), 105660.

Xu, L., Yang, S., Liu, B., 2021c. The effect of COVID-19 epidemic on shipping trade: an empirical analysis using panel data. Mar. Pol. 153 (Nov), 104768.

Yang, Z., Ng, A.K., Lee, P.T.W., Wang, T., Qu, Z., Rodrigues, V.S., Lau, Y.Y., 2018. Risk and cost evaluation of port adaptation measures to climate change impacts. Transport. Res. Transport Environ. 61 (Jun), 444–458.

Yi, K., Wang, Q.Q., Xu, J., Liu, B., 2021a. Attribution model of social media influencer’s travel intention: a systematic exploration based on psychological perspective. Front. Psychol., 797482.

Yi, K., Li, Y., Peng, H., Wang, X., Tu, R., 2021b. Empathic psychology: a code of risk prevention and control for behavior guidance in the multicultural context. Front. Psychol., 781710.

Yi, K., Zhang, D., Cheng, H., Mao, X., Su, Q., 2020. SEM and K-means analysis of the perceived value factors and clustering features of marine film-induced tourists: a case study of tourists to Taipei. J. Coast Res. 103 (SI), 1120–1124.

Zhang, L., Yi, K., Zhang, D., 2020. The classification of environmental crisis in the perspective of risk communication: a case study of coastal risk in Mainland China. J. Coast Res. 104, 88–93.

Zhang, M., Guo, X., Zhang, L., He, L., 2021. How to repair public trust effectively: research on enterprise online public opinion crisis response. Electron. Comm. Res. Appl. 49 (Sep), 101077.

Zhao, H., Lin, B., 2020. Impact of foreign trade on energy efficiency in China’s textile industry. J. Clean. Prod. 245 (Feb.), 118878.

Zhao, M., Zhang, P., He, G., 2021. Port-based welfare services for seafarers in Chinese industry. J. Clean. Prod. 245 (Feb.), 118878.

Zhao, H., Lin, B., 2020. Impact of foreign trade on energy efficiency in China’s textile industry. J. Clean. Prod. 245 (Feb.), 118878.

Zhao, H., Lin, B., 2020. Impact of foreign trade on energy efficiency in China’s textile industry. J. Clean. Prod. 245 (Feb.), 118878.

Zhao, H., Lin, B., 2020. Impact of foreign trade on energy efficiency in China’s textile industry. J. Clean. Prod. 245 (Feb.), 118878.