

An empirical study on factors affecting purchase intention of cross-border e-commerce consumer in post-pandemic era

(Work-in-Progress)

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ABSTRACT

The outbreak of COVID-19 promoted the further development of the Cross-border E-commerce (CBEC) industry worldwide. Due to lockdown and home quarantine policies, many countries across the globe followed the complete closure of shopping malls, transport networks, schools, universities, etc. This study aims to investigate factors that influence purchase intention of consumers in CBEC in post-pandemic era. Stimulus-Organism-Response (SOR) model, along with Howard-Sheth Model of consumer behavior and Technology Acceptance Model (TAM) has been employed to develop a structural model for the research. An empirical study including 322 copies of questionnaire were collected and were analyzed by SPSSAU. It has been found that input stimuli such as significant stimuli, symbol stimuli, social stimuli affect personal perception, while personal perception such as perceived risk, perceived usefulness and perceived ease of use affect purchase intention negatively or positively. Based on the study, suggestions were put forward for CBEC platform for further development.

Keywords: Purchase intention, Cross-border E-commerce, SOR, TAM.

INTRODUCTION

Since the broke out of Covid-19, many governments issued home quarantine measures to prevent the spread of the epidemic. In the context of the normalization of epidemic prevention and control, changes in consumer lifestyles have had a more direct impact on the growth of Cross-Border E-Commerce Consumer (CBEC) retail. Deloitte and Touche reports that “overall e-commerce retail sales in major countries in Europe, the US and Asia Pacific experienced high growth of more than 15% between 2019 and 2020” (Pu & Wang, 2021). Online consumer demand continues to release, CBEC has become an important force in stabilizing China's foreign trade. According to the National Bureau of Statistics, in 2021, the national residents' disposable income was 35,100 yuan, an increase of 9.1% year-on-year; per capita consumption expenditure was 24,100 yuan, an increase of 13.6% year-on-year. China's residents' consumption ability is increasing, and the demand for quality imported goods is growing day by day, creating good incremental space for imported CBEC (36Kr Research, 2022).

CBEC Platforms take corresponding measures in the storage, logistics, distribution to respond to the sudden lockdown areas due to the outbreak of epidemics. Hence, consumers also take anti-epidemic measures in the purchasing process, such as information notification, packaging, and delivery of goods, into consideration. This study attempts to investigate factors that influence purchase intention of Chinese consumers in CBEC in post-pandemic era. Based on the Stimulus-Organism-Response (S-O-R) Model, Technology Acceptance Model (TAM) and Howard-Sheth Model of consumer behavior, this study included significant stimuli, symbol stimuli and social stimuli as the input stimuli, observed perceived risk, perceived usefulness and perceived ease of use as the perceptual constructs to investigate the influence on purchase intention.

THEORITICAL BASIS AND HYPOTHESES

The Stimulus-Organism-Response Model

The Stimulus-Organism-Response (S-O-R) Model was proposed by Mehrabian and Russell in 1974. In the classical S-O-R model, *stimulus* is defined as those factors that affect internal states of the individual and can be conceptualized as an influence that stimulates the individual (Eroglu, Machleit & Davis 2001). According to Bagozzi (1991), when consumer behavior is depicted as an S-O-R system, the stimuli are external to the person and consist of both marketing mix variables and other environmental inputs. In this study, the stimuli are the significance, symbol and social stimuli as they affect the perceived sense of the consumer. *Organism* refers to internal processes and structures intervening between stimuli external to the person and the final actions, reactions, or responses emitted (Bagozzi, 1991). Organism represents the internal emotion and psychological process after encountering the stimulus and here in the study organism refers to the perceived risk, perceived usefulness and Perceived ease of use. *Response* in the model refers to the final behavioural outcome of an individual that may be positive or negative (Donovan and Rossiter, 1982). In this study CBEC purchase intention was taken as the response in the research model.

Howard-Sheth Model of consumer behavior

Howard and Sheth put forward a model which describes how people make purchase decisions when they shop for products (Howard & Sheth, 1969). The model assumes that input stimulus and external factors can stimulate purchases, motivate consumers to buy, and then provide them with a variety of information choices that affect their perceptions (internal factors). Consumers are influenced by stimuli, which in turn influence their purchasing decisions. Stimuli include significance stimuli (price, service, etc.), symbolic stimuli (advertising, media, etc.), and social stimuli (family, social group, etc.) (Ma & Li, 2020).

O’Cass and Fenec (2003) proposed that customer involvement in online purchase factors is influenced by external factors such as their characteristics, purchase experience, and product guidance. Cao and Li (2018) pointed out that factors such as the safety of a company's products, reputation, and web interface affect consumers' choice of online travel websites. Ma and Li (2020) suggested factors that affect the purchase intention of cross-border tourism products online contain perceived usefulness, perceived ease of use, product stimulus factor, symbolic stimulus factor, and social stimulus factor, all of which have significant effects on consumers' willingness to purchase online. Therefore, this paper proposes the following hypotheses:

H1a: Significant stimuli positively affect Perceived Risk

H2a: Symbol stimuli positively affect Perceived Risk

H3a: Social stimuli negatively affect Perceived Risk

H1b: Symbol stimuli positively affect Perceived Usefulness

H2b: Significant stimuli positively affect Perceived Usefulness

H3b: Social stimuli positively affect Perceived Usefulness

H1c: Symbol stimuli positively affect Perceived Ease of Use

H2c: Significant stimuli positively affect Perceived Ease of Use

H3c: Social stimuli positively affect Perceived Ease of Use

Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) was introduced by Fred Davis in 1985 and specifically tailored for modelling users' acceptance of information systems or technologies or new product acceptance. The goal of Davis' TAM is to explain the general determinants of technology acceptance that lead to explaining users' behaviour across a broad range of end-user computing technologies and user populations. The belief of the person towards a system might be influenced by other factors referred to as external variables in TAM. TAM consists of five elements: perceived usefulness, perceived ease of use, attitude toward use, behavioral intentions, and system use. The external variables influence intention to use through perceived usefulness and perceived ease of use, and the actual actions of users are predicted by intention to use. The present study was based on Technology Acceptance Model that was formed by Venkatesh (2000) and Davis who found that both perceived usefulness and perceived ease of use have a direct influence on behaviour intention, thus eliminating the need for the attitude construct. Many researchers have supported that TAM model is proven suitable for measuring the adoption of e-commerce (Chen et al., 2002; Moon & Kim, 2001). Later, the TAM model has been widely used in the study of users' intention to use in the fields of online learning, e-commerce, and online consumer behavior, and the adaptability and reliability of the model have been widely affirmed. The TAM model is used to study users' acceptance and willingness to use cross-border online shopping with certain validity. Li (2014) found that perceived usefulness and ease of use positively affect college students' intention to make mobile online purchases. Li et al. (2016) confirmed with a technology acceptance model that perceived usefulness has a direct positive effect on both users' WeChat shopping attitude and usage behavior. Hence, TAM was used as the basis of the theoretical framework in this study. Both variables in TAM, i.e. *perceived usefulness* and *perceived ease of use*, were included in this study's research model. Therefore, this paper proposes the following hypotheses:

H4: Perceived Ease of Use positively affects Perceived Usefulness

H5: Perceived Usefulness positively affects Purchase Intention

H6: Perceived Ease of Use positively affects CBEC Purchase Intention

Perceived Risk

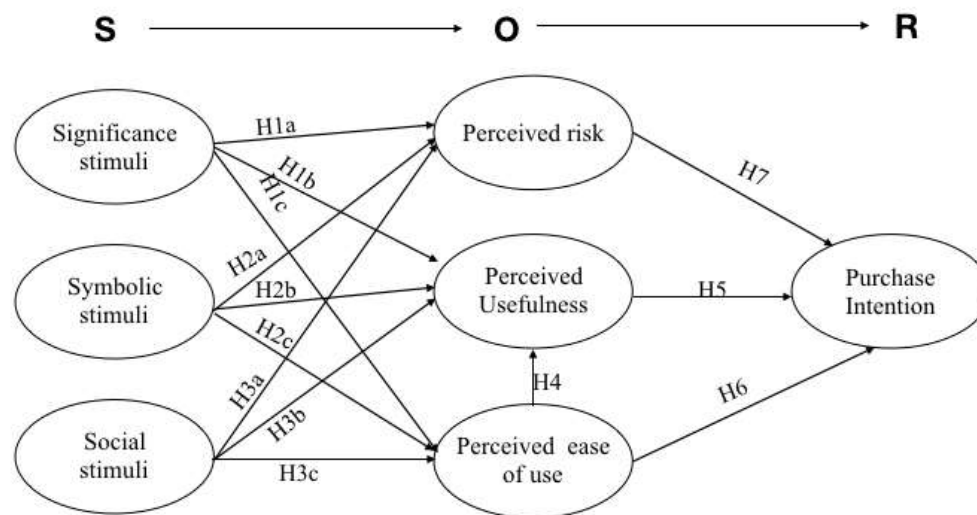
With the emergence of technology, additional variables are introduced to the TAM so as to produce an extended TAM for predicting consumers' intention to use. Perceived risk was first introduced by Bauer (1960) at Harvard University, Bauer defined perceived risk as: the probability of failure of an individual's predicted consumption decisions and the severity of adverse outcomes from the use of these tangible or intangible goods. Jarvenpaa et al. (1996) first included privacy risk as a dimension of perceived risk when they studied online shopping. Since then, many domestic and international scholars have included privacy risk in their research models when studying user behavior in online environments and found that privacy risk has a significant impact on users' behavioral intentions. There are many applications of perceived risk in e-commerce, and many studies have demonstrated its impact on shopping attitude (Yang, Satath&Lee, 2016), purchase intention (Li et al., 2020), satisfaction (Gan & Wang, 2017), etc. Wang et al. (2020) showed through an empirical investigation that perceived risk has a negative relationship with purchase intention. These variables include product involvement (Koufaris, 2002), cost (Shih, 2004) and perceived risk (Pavlou, 2003). Perceived risk is defined as consumers' perceived risk and their own tolerance of risk taking that influence their financial transaction decision (Chan & Lu, 2004). Perceived risk has been shown to reduce consumer's intention to engage internet transactions (Jarvenpaa et al., 2006), which will be the same for CBEC platform that integrates card, internet and mobile transaction. When consumers make CBEC purchases, they have concerns in terms of privacy

disclosure and payment security. Perceived risk suggests the idea that consumers' may be influenced during the CBEC purchase by the feelings like concern of the Covid virus and uncertainty in post-pandemic era in this research. Therefore, *perceived risk* is included to the TAM model in this study. These concerns of users belong to the category of perceived risk, and the following hypotheses is proposed:

H7: Perceived Risk negatively affects Purchase Intention

Research Model

Based on the theoretical models mentioned above, to examine the factors affecting purchase intention of CBEC Consumer in post-pandemic era, this study included significance stimuli(SiS), symbolic stimuli(SyS) and social stimuli(SoS) as input stimulus based Howard-Sheth Model of consumer behavior and S-O-R Model; took perceived usefulness(PU), perceived ease of use(PEOU) and perceived risk(PR) as the perception constructs in organism section; focus on CBEC purchase intention(PI) as response section. Thus, the research model was proposed as follow:



Factors Affecting CBEC Consumer Purchase Intention Model

Figure 1. Research model

DATA COLLECTION AND ANALYSIS

Scale Design

This paper adopts the questionnaire survey method. In order to ensure the authority of each variable definition, through the previous literature review and the specific actual situation of paying for virtual brand community knowledge, this research has made a corresponding variable definition for each variable. In this study, classical scales were referred to, and a predictive test was conducted. According to the feedback of the predictive test, the questionnaire was modified to form the final questionnaire. The research model in this paper has a total of 7 variables with 22 items are set in the questionnaire and measured in the form of a Likert 7-level scale.

Data Collection

The questionnaire is divided into two parts. The first part is of basic personal information, and the second part is the factors affecting purchase intention of CBEC consumers in post-pandemic era. To ensure the rationality and validity of the questionnaire, the questionnaire is distributed in pre-survey stage and formal investigation stage. At the pre-survey, 110 questionnaires were distributed, and the data were used to modify the questionnaire. The collected data are analyzed by SPSSAU for the reliability and validity of the questionnaire. According to the corresponding feedback, the content and structure of the questionnaire are enriched and improved to ensure the scientificity and validity of the final questionnaire. During the formal survey period, 400 questionnaires were distributed and total of 322 valid questionnaires were obtained after eliminating the invalid questionnaires. According to the statistics, 90% of the respondents who participated in the questionnaire were female, and the age group below 45 years old was dominant; those with college and bachelor's degree accounted for the majority; those with a monthly income of 3,000-8,000 yuan accounted for 50%; the annual expenditure on CBEC was 1,500-8,000 yuan, accounting for 89% in total.

Test of Reliability and Validity

The reliability and validity test results of the questionnaire on factors affecting purchase intention of CBEC consumer in Post-pandemic era can be found in Table 1. AVE and CR were used for convergent validity analysis; usually an AVE greater than 0.5 and a CR greater than 0.7 indicated high convergent validity. Composite AVE ranging from 0.628 to 0.730 means the validity of the analysis is adequate. CR indices of measurement items in this study are higher than 0.7, suggesting good internal consistency and reliable analysis results. Cronbach's α stands for the extent of the close relationship of items in a

group, and is used to measure the scale reliability of the items. When Cronbach's α is higher than 0.8, it implies that the items have a relatively high internal consistency.

Table 1: Test of reliability

Construct	AVE	CR	Cronbach's α
SiS	0.661	0.886	0.881
SyS	0.632	0.784	0.817
SoS	0.711	0.880	0.877
PR	0.628	0.796	0.822
PU	0.602	0.819	0.816
PEOU	0.730	0.890	0.889
PI	0.669	0.858	0.858

The validity analysis of all the measures shown in Table 2 suggests that the KMO value of the overall scale was greater than 0.8, and the significance of Bartlett's spherical test value was less than 0.001, indicating that the study data had good validity and reached a significant level.

Table 2: Test of KMO and Bartlett

KMO		0.849
	Chi-square	362.335
Bartlett's Test	<i>df</i>	21
	<i>p</i>	0.000

Test of Model Fitness

Table 3: Model fitness

Indicator	χ^2/df	GFI	RMSEA	AGFI	CFI	NFI	NNFI
Std. value	<3	>0.9	<0.10	>0.9	>0.9	>0.9	>0.9
Value	2.047	0.913	0.080	0.932	0.917	0.923	0.901

The model fitness value in Table 3, $\chi^2/df=2.047 < 3$, GFI= 0.913, RMSEA=0.080, AGFI=0.932, CFI=0.917, NFI=0.923, NNFI=0.901, implying that the model is statistically significant and worth being further analyzed.

Table 4: Path coefficients

X	→ Y	Unstd. Coef	SE	<i>z</i> (CR)	<i>p</i>	Std. Coef	Conclusion
SiS	→ PR	0.271	0.061	2.976	0.006	0.312	Support
SyS	→ PR	0.529	0.100	5.299	0.000	0.540	Support
SoS	→ PR	-0.050	0.082	-0.618	0.000	-0.057	Support
SiS	→ PU	0.306	0.077	3.956	0.000	0.287	Support
SyS	→ PU	0.432	0.063	2.794	0.027	0.488	Support
SoS	→ PU	0.145	0.057	2.545	0.011	0.154	Support
SiS	→ PEOU	0.455	0.096	4.727	0.000	0.396	Support
SyS	→ PEOU	0.283	0.091	3.118	0.002	0.249	Support
SoS	→ PEOU	0.188	0.074	2.524	0.012	0.184	Support
PEOU	→ PU	0.420	0.059	7.130	0.000	0.453	Support
PR	→ PI	-0.107	0.066	-1.633	0.008	-0.088	Support
PU	→ PI	0.377	0.092	4.083	0.000	0.334	Support
PEOU	→ PI	0.525	0.086	6.127	0.000	0.501	Support

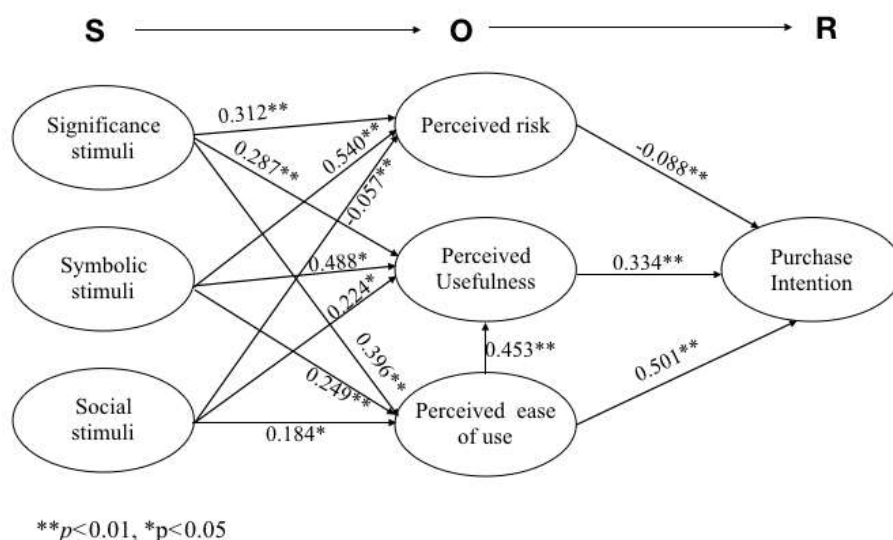
Table 4 shows the path coefficients and the structural relationships of the model, which include the unstandardized path coefficient (Unstd. Coef.), standard error (SE), *z* values (CR), the corresponding significance of the effects (*p* values), standardized path coefficient (Std. coef) and conclusions of support for each hypothesis.

Specifically, SiS has a standardized path coefficient value of $0.312 > 0$ for PR influence and this path shows a significance at 0.01 level ($z=2.976$, $p=0.006 < 0.01$), thus indicating that SiS has a significant positive influence on PR; SyS has a standardized path coefficient value of $0.540 > 0$ for PR influence and this path shows a significance at 0.01 level ($z=5.299$, $p=0.000 < 0.01$), thus indicating that SyS has a significant positive influence relationship on PR; SoS has a standardized path coefficient value of $-0.057 < 0$ for PR influence and this path shows a negative significance at 0.01 level ($z=-0.618$, $p=0.000 < 0.01$), thus indicating that SoS has negative influence relationship on PR; SiS has a standardized path coefficient value of $0.287 > 0$ for PU influence and this path shows a significance at 0.01 level ($z=3.956$, $p=0.000 < 0.01$), thus indicating that SiS has significant positive influence relationship on PU; SyS has a standardized path coefficient value of $0.488 > 0$ for PU influence and this path

shows a significance at 0.05 level ($z=2.794$, $p=0.027<0.05$), thus indicating that SyS has significant positive influence relationship on PU; SoS has a standardized path coefficient value of $0.154>0$ for PU influence and this path shows a significance at 0.05 level ($z=2.545$, $p=0.011<0.05$), thus indicating that SoS has significant positive influence relationship on PU. SiS has a standardized path coefficient value of $0.396>0$ for PEOU influence and this path shows a significance at 0.01 level ($z=4.727$, $p=0.000<0.01$), thus indicating that SiS has significant positive influence relationship on PEOU; SyS has a standardized path coefficient value of $0.249>0$ for PEOU influence and this path shows a significance at 0.01 level ($z=3.118$, $p=0.002<0.01$), thus indicating that SyS has significant positive influence relationship on PEOU; SoS has a standardized path coefficient value of $0.184>0$ for PEOU influence and this path shows a significance at 0.05 level ($z=2.524$, $p=0.012<0.05$), thus indicating that SoS has significant positive influence relationship on PEOU. As a result, hypotheses H1a, H1b, H1c, H2a, H2b, H2c, H3a, H3b and H3c were supported.

PEOU has a standardized path coefficient value of $0.453>0$ for PU influence and this path shows a significance at 0.01 level ($z=7.130$, $p=0.000<0.01$), thus indicating that PEOU has significant positive influence relationship on PU; PU has a standardized path coefficient value of $0.334>0$ for PI influence and this path shows a significance at 0.01 level ($z=4.083$, $p=0.000<0.01$), thus indicating that PU has significant positive influence relationship on PI; PEOU has a standardized path coefficient value of $0.501>0$ for PI influence and this path shows a significance at 0.01 level ($z=6.127$, $p=0.000<0.01$), thus indicating that PEOU has significant positive influence relationship on PI; As a result, hypotheses H4, H5 and H6 were supported.

PR has a standardized path coefficient value of $-0.088<0$ for PI influence and this path shows a negative significance at 0.01 level ($z=-1.633$, $p=0.008<0.01$), thus indicating that PR has negative influence relationship on PR. As a result, hypotheses H7 was supported.



Factors Affecting CBEC Consumer Purchase Intention Model

Figure 2. Test result of research model

Based on the test result of research model, it is apparent that all the hypotheses are verified. In the context of post-pandemic, significance stimuli, symbolic stimuli and social stimuli have positive influence on perceived usefulness and perceived ease of use; social stimuli have negative influence on perceived risk; perceived usefulness and perceived ease of use have positive influence on CBEC purchase intention while perceived risk has negative influence on purchase intention.

CONCLUSION AND SUGGESTIONS

Significance stimuli

From the perspective of significance stimuli, besides to ensure the quality and diversity of goods, CBEC platforms should seize the opportunity to take advantage of the channel to ensure a balance between supply and demand of goods and services, and enhance the ability to respond to the synergy of goods on display, packaging, distribution.

Symbol stimuli

During the post-pandemic era, new users are attracted to the CBEC platform, and it is crucial to managing these new users well. Discount offers and holiday promotions campaigned via different channels are two important types of activities that attract consumers. Consumers consider price to be the most important factor among the many advantages of CBEC consumption. From the perspective of symbol stimuli, the platform should consider pushing specific products and preferential discounts for new users, and at the same time carry out differential management strategies for old and new users to increase customer stickiness and give full play to the scale effect of new users pulled during the post-pandemic era to continuously accumulate resources and retain users.

Social stimuli

As consumers become more sophisticated and selective, it becomes increasingly difficult for them to become loyal users of platforms. From the perspective of social stimuli, product quality is the main content of social evaluation and the root of business reputation. The quality of products must meet or exceed consumers' psychological expectations in order to satisfy consumers and generate positive word-of-mouth publicity. In the context of epidemic prevention and control, CBEC consumers are more likely to obtain and spread word-of-mouth messages through online information and other Internet means, so platforms should make efforts to win over the market by making good use of product packaging and display as well as promotional strategies. When the product meets the consumer's needs and establishes a certain emotional base with the consumer, it is easier to obtain good word-of-mouth publicity and increase purchase intention.

Perceived risk

Consumers will give priority to the safety of consumption in the case of information inequality. From the perspective of perceived risk, CBEC platform should strengthen the supervision of the platform, increase the management of industrial integrity, establish an information management system by big data to strengthen the prevention of credit risk. At the same time, establish channels to defend rights of consumers while expose the default platform to promote the healthy development of the e-commerce industry .

Perceived usefulness

From the perspective of perceived usefulness, CBEC industry should expand the cooperation platform and channels to ensure consumers with satisfactory supplies and services, while focusing on product packaging and pushing new products with high frequency to drive sales growth while tapping more potential customers.

Perceived ease of use

From the perspective of perceived ease of use, CBEC platform should improve the online and offline service level. Customer service is required to respond to customers' questions in a timely manner and give effective answers. Setting up special channels for consultation, inquiries and complaints, and protecting the basic rights and interests of consumers, so as to lay a solid foundation for creating a good CBEC purchasing environment.

Research Limitations and Future Prospects

This paper mainly studies the factors affecting purchase intention of CBEC consumer in post-pandemic era. Although some conclusions have been drawn, there are still deficiencies in many aspects of research. The following summaries are made, and prospects are made for subsequent studies.

In this study, due to the many limitations of sample collection, most of the survey subjects involved are from Hubei Province, China and there is a certain proportion of imbalance. It will affect the research conclusions to a certain extent, and the sample interpretation ability needs to be improved. In future studies, the range of samples can be expanded to make research results more representative and accurate, and big data can also be used to obtain more data support to enhance the scientific nature of the research.

This study selected limited variables when constructing a model of the factors affecting purchase intention of CBEC consumer in post-pandemic era. There are many different influencing factors of purchase intention to participate in different contexts. This study only considers some variables in the context of CBEC consumers in post-pandemic era, and the selection of model variables is insufficient. In addition, the actual factors such as the personal characteristics and profession of the participating users will also affect the purchase intention to a certain extent. This is not considered in this study, and the population is not distinguished. In future research, more relevant factors will be introduced in the research content, and the research model will be continuously improved, with a view to drawing more representative research conclusions and more comprehensively exploring the factors affecting the factors affecting purchase intention of CBEC consumer in post-pandemic era.

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