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## **Will Alibaba's additional financial service contribute to sellers' satisfaction and loyalty during the pandemic? – Evidence from Taobao sellers**

**Abstract:** Electronic commerce (e-commerce) has shown dramatic growth in recent decades, and sellers on e-commerce platforms have also been affected by the global COVID-19 pandemic. By collecting data from 313 Taobao sellers, we investigated the relationships among e-commerce platform additional financial service quality, sellers' satisfaction, and loyalty to the platform, as well as the moderating roles of sellers' financial pressure during the pandemic and perceived COVID-19 government financial support in the satisfaction-loyalty relationship. Our results show that better financial service quality enhances sellers' satisfaction with the platform, which in turn translates into platform loyalty. We also evidence the moderating effects of COVID-related financial pressure and sellers' perception of COVID-related government financial relief policy on the satisfaction-loyalty relationship. Our research makes potential contributions to the e-commerce field and provides timely guidance for e-commerce practice in the pandemic period.

## **Introduction**

Recent decades have witnessed the dramatic growth of electronic commerce (e-commerce); the COVID-19 pandemic has further stimulated its global dynamic growth. Most recently, Chevalier (2022) has stated on the Statista website that retail e-commerce sales reached approximately 4.9 trillion U.S. dollars worldwide in 2021, and that this is predicted to grow by 50% over the next four years. Ma (2022) has also stated on Statista that China has the biggest portion of e-commerce market size and sales, making it world-leading in this area. While Amazon is the pioneer in the global market, Alibaba, China's long-reigning e-commerce giant, has also witnessed rapid growth in its home market. However, the giant is now dealing with constant challenges. It faces fierce competition from traditional e-commerce competitors such as JD.com and Pinduoduo, as well as fast-growing video-sharing upstarts such as Kuaishou and Douyin, which sell goods through livestreaming and short videos. Meanwhile, it has been hit by antitrust regulators, who are attempting to break its iron grip on China's online shoppers. Therefore, maintaining sellers' loyalty to the platform is one of Alibaba's current strategic priorities and is crucial to the platform's survival, as client loyalty in electronic environments has become competitive and increasingly essential (Semeijn et al., 2005).

For an e-commerce platform company, attracting and retaining sellers is the most important foundation for maintaining the prosperity of the platform as a whole. In contrast to the conventional marketplace, an e-commerce platform is a two-sided market platform that serves two types of agents: customers and sellers (Li et al., 2010). Within these two-sided markets, it is deemed that 'the participation of at least one group raises the value of participating for the other group' (Rosen, 2005, p. 147). Therefore, the success of the platform not only requires the participation of customers but also that of sellers. Establishing and maintaining a long-term relationship with a large number of sellers is of equal importance to attracting customers. Prior literature has recognized that it is difficult to maintain loyalty in the online context due to clients' high-risk perceptions of the electronic channel, causing them to lack

confidence in e-commerce (Wu et al., 2012). Thus, the choice of platform for making transactions depends on sellers' cognition of the platform and their emotional state when using it. Furthermore, online sellers have various alternative platforms to choose from and the costs of switching are lower than in the offline context; as such, sellers' willingness to continue participating in the platform and remain loyal to it plays a key role in ensuring the platform's activity and sustainable development. Although the study of e-loyalty has attracted increasing attention in academia, the focus of extant studies has primarily focused on the perspective of customers; research on client loyalty between e-sellers and e-commerce platforms is scarce.

In the traditional business environment, firms must continually satisfy their clients in order to establish and maintain a stable and long-term relationship with them (Anderson and Weitz, 1992; Morgan and Hunt, 1994). Although the development of technology has changed the place of business, the basic laws and rewards of building relationships with clients still hold in the context of e-commerce (Janita and Miranda, 2013). For sellers to remain loyal to a platform, the platform must strive to provide premium services and products in order to improve clients' experience when compared with their competitors (Reichheld and Schefer, 2000). The provision of additional financial services by a platform is an important function in the business to business (B2B) environment. Extant studies have investigated the impact of e-commerce platform service quality on customers' satisfaction and loyalty to the platform (Cai et al., 2020; Gummerus et al., 2017); however, the questions of whether and how the financial services offered by e-commerce platforms contribute to platform loyalty have been neglected. Thus, this present study aims to contribute to this research area by exploring how financial service quality, as one additional feature of e-commerce platforms, will affect platform loyalty on the part of e-sellers.

In contrast to other e-commerce competitors, Alibaba has the most complete financial support for sellers, as the platform benefits from Ant Group (formerly known as Ant Financial or Alipay, an affiliate financial company of Alibaba Group). Alibaba has provided financial support to its sellers since 2010. Sellers can apply for various forms of loans via the platform, such as small business loans, Taobao credit

loans and order loans. In contrast to traditional financial institutions, which prefer to provide capital to established and mature firms only, the internet finance of Alibaba specifically targets sellers on the platform by offering these small and micro enterprises easier access to business finance and other types of financial services. As COVID-19 has spread, these small businesses have faced an extremely tough business environment and have found it harder to acquire funds due to the high level of uncertainty. Alibaba has provided more financial support to sellers under these conditions, helping them to overcome the challenges.

Taking advantage of recent events, this paper aims to explore empirically whether and how the financial service quality provided by Alibaba has affected sellers' loyalty towards the e-commerce platform. By utilizing 313 qualified survey responses collected from Taobao sellers, this research investigates how the four dimensions of financial service quality, namely privacy and security quality, information and reliability quality, service quality and product and design quality, affect clients' (platform sellers') satisfaction with the financial service provided by the e-commerce platform. In addition, this study further investigates whether and how this additional financial service satisfaction translates into sellers' loyalty to the platform. We find that when the additional financial service provided by the platform has better quality in privacy and security, information and reliability and service provision, sellers will be more satisfied with the platform and more likely to remain loyal to it.

Moreover, we also explore how the extent of financial pressure on sellers caused by COVID-19 and sellers' perception of governmental financial support for COVID-19 moderates the relationship between additional financial service satisfaction and platform loyalty. Specifically, we find that perceived COVID-19-related financial pressure has a positive moderating effect on the satisfaction-loyalty relationship, while sellers' perception of COVID-related government financial relief policy has a negative moderating effect on this relationship.

Our research responds to a series of important calls in previous research on e-commerce platforms and makes several important theoretical contributions. First,

this study extends the e-loyalty and e-satisfaction literature from a fresh angle. Additional financial services have become an important feature of e-commerce platforms, as they attract more sellers to participate in the platform and thus contribute to its sustainable development. Although prior studies have examined the impact of service quality on customers' satisfaction and loyalty to e-platforms, the role of additional financial services in generating sellers' loyalty to the platform has largely been neglected. To our best knowledge, this study is the first to conceptualize and incorporate additional financial services into the e-satisfaction and e-loyalty model.

Second, by drawing upon the Stimuli-Organism-Response (S-O-R) framework, we show how the additional service quality of an e-commerce platform, which can be seen as the environmental stimuli, affects sellers' response, i.e. whether they remain loyal towards the platform. We thus complement e-loyalty studies by presenting this additional financial service quality act as a potential antecedent of sellers' e-loyalty.

Third, as discussed earlier, sellers play an equally vital role to customers in the success of e-commerce. In contrast to prior studies, which focus more on customers, this study examines the above research questions from the perspective of sellers, providing a new insight and direction for e-commerce and e-loyalty literature. Furthermore, by adopting the S-O-R framework, we adapt the consumer behaviour theory to e-commerce platform research, providing a new insight for e-commerce studies.

Finally, COVID-19 has been a unique event that has intensely transformed people's daily lives and the nature of business. It has been a natural disaster representing a sudden environmental uncertainty that has greatly changed consumer behaviour and the way that businesses respond. As COVID-19 has further fuelled the adoption of e-commerce, it provides us with a unique setting to investigate how external environmental uncertainty affects the sustainable development of e-commerce platforms.

The rest of the paper is organized as follows. Section two reviews the relevant literature and develops hypotheses. Section three discusses the methodology. The results are presented in section four; section five concludes the paper.

## **Theoretical background and hypotheses development**

The S-O-R model, first proposed by Russel and Mehrabian (1974), has mainly been applied to retail industry, especially online retail industry. The S-O-R model states that stimuli influence consumers' 'organism', or emotional state, and subsequently affects their response. In other words, information from merchants and products will first affect consumer cognition and then directly or indirectly affect consumer behaviour. In recent years, this framework has been widely and successfully used in extant retail (Vieira, 2013; Xu et al., 2014). Consistent with previous studies, e-commerce literature has explained how consumers react to environmental stimuli such as web atmospheric cues (Eroglu et al., 2001; Mazaheri et al., 2011); these cues impact the customers' cognition by exerting direct or indirect stimuli, which leads to specific behaviours.

During this cycle, the stimuli are transformed by the customers into significant insights; thereby, inferring these notions and perceptions of special tasks can illustrate an individual's feelings and psychological state (Albarq, 2021). The reaction implies the counteraction of a person, which includes both attitudinal and behavioural responses. In addition, the organism acts as a transitional platform to ensure behavioural outcomes or buybacks (Shatnawi et al., 2019). In general, consumer behaviour will change with an environmental stimulus. It has been evidenced that multiple stimulating factors affect store performance, as well as the emotional and cognitive state of customers in terms of feelings and trust.

In addition, Viio and Grönroos (2016) found that the relationship between corporate customers requires both commitment and fulfilment in order to achieve customer-perceived value expectations. Customers want to be recognized, appreciated and engaged before a product is delivered (Buell et al., 2017; Cai et al., 2020; Gummerus et al., 2017). When the value, including benefits, derived from the relationship is positive, the customer will be more willing to establish a long-term relationship with the supplier, leading to increased retention and loyalty (Chang et al., 2015).

Drastic changes in the environment will change the perception and thinking of consumers, which will be reflected in their purchase behaviour, resulting in panic buying (Leung et al., 2020) and impulse buying behaviour (Mohan et al., 2013). COVID-19, as an emergency, has had a certain impact on corporate financing behaviour. At present, this type of research is mainly focused on impacts on consumers' personal behaviour. The quality of news, information and communication about COVID-19 has played an important role in individual decision-making and behaviour (Laato et al., 2020). The S-O-R framework has been used to investigate how exposure to online information sources (stimuli) during the early stages of the pandemic affected the consumer's degree of cyberself-illness and his or her willingness to make unusual purchases. The authors found that 'after the data collection period for the present study ended, consumers quickly adapted to the new normal of COVID-19' and called for more longitudinal studies in order to capture the way these behaviours evolve. The quality of news, information and communication regarding COVID-19 has played an important role in individuals' decision-making and behaviour (Cai et al., 2020; Gummerus et al., 2017).

Therefore, the quality of additional financial services provided by e-commerce platforms plays out as a stimulus factor. The quality affects sellers' satisfaction with e-commerce, i.e. the organism. In turn, this influences sellers' platform loyalty, i.e. the response. Furthermore, perceived COVID-19 financial pressure has enhanced sellers' gratitude to the platform during the pandemic, whereas perceived COVID-19 government financial assistance policy has decreased the dependence of sellers on platforms' financial support. Those two factors affect the relationship between organism and response in the e-commerce context.

#### *E-commerce platforms' additional financial service quality*

Many scholars have developed service quality measurement indexes for e-commerce platforms, such as the four dimensions of technical adequacy, specific content, content quality and web appearance (Aladwani and Palvia, 2002) or the three dimensions of customer service quality, online system quality and bank service

product quality (Jun and Cai, 2001). In this research, we mainly studied the financial service quality of the platform for sellers and merchants during the epidemic crisis.

Previous studies have explored the relationship between financial service quality and customer loyalty. For example, several studies have investigated the impact of e-commerce platform service quality on sellers' satisfaction and loyalty to the platform (Cai et al., 2020; Gummerus et al., 2017). Ibrahim et al. (2006) incorporated the modified model of e-banking service quality with the six determinants of convenience/accuracy, accessibility/reliability, friendly/responsive customer service, good queue management, personalization and targeted customer service. Aladwani and Palvia (2002) identified four dimensions of e-service quality: technical adequacy, specific content, content quality and web appearance. These are all associated with overall service quality. By reflecting existing studies, this paper has identified four dimensions of e-commerce platform additional financial service quality, namely privacy and security quality, information and reliability quality, service quality and product and design quality.

Drawing upon the S-O-R framework and the above discussion, we developed the research framework shown in Figure 1.

[Insert figure 1]

### **Privacy and security quality**

Privacy and security play a crucial role in the online financial service environment. Service users need to upload a considerable amount of personal information and transaction data to service providers. Unlike offline financial service providers, the financial service under study is provided by the e-commerce platform, which lacks endorsement and trust to a certain extent. Prior studies have shown that customers' acceptance of internet finance is related to factors such as security, cost and profitability (Narayanasamy et al., 2011). In the digital environment, companies' satisfaction becomes more sensitive than ever because this information is not tangible. A company needs to ensure that security satisfaction, security-related personal data and transaction security has a good impact on customer satisfaction (Li et al., 2021).

In addition, many sellers, mainly small and medium-sized enterprises, are concerned about the security of e-commerce transactions and legitimacy. This may result in a preference for the traditional mode of commercial trade (Purcell and Toland, 2003).

Therefore, in our research context, the sellers are concerned about privacy and security quality when they use the additional financial services provided by e-commerce providers, which may relate to their satisfaction with the e-commerce platform. Based on these arguments, we hypothesize the following:

**H1a:** *Privacy and security quality has a positive impact on e-commerce platform additional financial service satisfaction.*

### **Information and reliability quality**

The information and reliability quality dimension refers to the adequacy and accuracy of information obtained by users when they visit the website. The information provided by the website should be comprehensive, complete, sufficient, relevant and up-to-date (Yang et al., 2005). In the online financial service environment, the information and reliability of the service will influence users' feelings and acceptance. Due to the decrease in customers' perceptions of control over their online transactions, information and reliability can contribute to online trust building, which is an important component of online financial service satisfaction.

Sellers who utilize e-commerce additional financial support need to find a fit-for-task and easy way of understanding information. The content of the information should be reliable and well communicated. Thus, information and reliability quality is one dimension where users can evaluate whether a website's features meet their needs. Therefore, based on these arguments, we hypothesize the following:

**H1b:** *Information and reliability quality has a positive impact on e-commerce platform additional financial service satisfaction.*

### **Service quality**

The third dimension of additional financial service quality is service quality. E-commerce platforms provide an extended financial service to sellers. As the intermediary, a responsive and helpful service will influence customers' satisfaction (Wolfenbarger and Gilly, 2003). Service providers must address users' requests throughout the whole process; this can include helping them to understand functions, offering live support 24/7 and providing timely responses whenever users face problems. In addition, the service should also include after-usage service and complaint-solving functions. Hence, good service reduces transaction uncertainty and contributes to a high evaluation of the platform's value. Therefore, based on these arguments, we hypothesize the following:

**H1c:** *Service quality has a positive impact on e-commerce platform additional financial service satisfaction.*

### **Product and design quality**

Product and design quality influences customers' perception of service provision and their behavioural intentions. As an infrastructure, the product and design play key roles in attracting and retaining users (Collier and Bienstock, 2006; Connolly et al., 2010; Wolfenbarger and Gilly, 2003). If a site is simple and easy for customers to use, the quick navigation and efficient website organization will facilitate access to the service and could enhance the reputation of the service provider. Previous research has shown that a good design affects the selection and adoption of online banking services (Akinici et al., 2004; Clemes et al., 2012). Moreover, a better design will positively affect users' perceptions of usefulness and improve their attitudes (Cristobal et al., 2007; Fassnacht and Köse, 2007; Kim et al., 2011; Lin and Sun, 2009). It is reasonable that a well-designed service will positively contribute to users' satisfaction. Thus, we propose that:

**H1d:** *Product and design quality has a positive impact on e-commerce platform*

*additional financial service satisfaction.*

***E-commerce platform additional financial service satisfaction and sellers' loyalty to e-commerce platforms***

Loyalty refers to a favourable attitude on the part of customers towards sellers, which results in repeated purchasing behaviour (Srinivasan et al., 2002). A large number of existing studies have shown that satisfaction increases loyalty and repurchase intention in the online environment (Cristobal et al., 2007; Fassnacht and Köse, 2007; Kim et al., 2011; Lin and Sun, 2009). In our research context, a higher level of satisfaction leads to a good relationship with sellers who utilize the additional financial services on an e-commerce platform. Higher satisfaction with the financial service on the part of sellers will translate into a more positive attitude to the e-commerce platform, thereby increasing their loyalty. Additionally, sellers, as special customers in the platform economy, prefer to choose a platform that is familiar but also meets their multiple needs in a satisfactory way. Therefore, based on these arguments, we hypothesize the following:

**H2:** *E-commerce platform additional financial service satisfaction positively influences e-commerce platform loyalty.*

***The mediating role of satisfaction***

As discussed above, the S-O-R model suggests that an internal mechanism translates an external stimulus into a behavioural response through a psychological process. In this study, H1 suggests that service quality has a positive impact on e-commerce platform additional financial service satisfaction. H2 proposes that e-commerce platform additional financial service satisfaction positively influences e-commerce platform loyalty. The existing studies on customer satisfaction have also suggested that quality of service shapes users' loyalty by influencing their satisfaction. In light of this theoretical background and empirical evidence, we further investigate

these psychological mechanisms through service quality to e-commerce loyalty.

Therefore, we hypothesize that:

**H3:** *E-commerce platform additional financial service satisfaction mediates the relationship between: (a) privacy and security quality; (b) information and reliability quality; (c) service quality; (d) product and design quality; and (e) e-commerce platform loyalty, respectively.*

***The moderating role of perceived COVID-19 financial pressure and perception of COVID-19 government financial relief policy***

COVID-19 was identified in December 2019, and the resulting pandemic is still ongoing. It has exerted tremendous impact on every aspect of society and business. As of 25 April 2022, the pandemic had caused more than 509 million infections and more than 6.2 million deaths. The United Nations has warned that the COVID-19 pandemic affects societies and economies at their core; it is far more than a health crisis. Scholars have shown that COVID-19 has caused reductions in income, a higher rate of unemployment and bankruptcy among enterprises. As SMEs have less access to capital, they are more sensitive to financial pressure during such an extensive natural disaster. According to a McKinsey survey, 52% SMEs stated that they could go out of business in fewer than 12 months under the economic conditions at the time. In the meantime, governments have also played an important role in combatting the spread of the virus. Various measurements have been undertaken by governments to ease economic stress at the macro level.

Therefore, it is interesting to ascertain how the extent of financial pressure on sellers caused by COVID-19 and sellers' perception of governmental financial support for COVID-19 has moderated the relationship between additional financial service satisfaction and platform loyalty. COVID-19 represents an unexpected natural disaster that has brought huge uncertainty to the daily lives of individuals. It thus acts as a natural experiment to test how external uncertainty affects e-satisfaction and e-loyalty.

It is worth noting that the condition for online SMEs (those discussed in this paper) is quite different from physical and offline SMEs. Although the general economy is in decline, e-commerce sales are expecting a steady growth forecast worldwide due to their online nature. As social distancing and quarantine policies have been introduced by governments during the outbreak of the pandemic, the majority of consumers transferred to online shopping for self-protection purposes. This has boosted the sales of e-commerce platforms. In the meantime, as the transport sector has been considerably affected due to China's strict pandemic policy, online SMEs have also been affected. Thus, Alibaba Group has provided 10 billion RMB special loans with a 20% discounted interest rate for sellers. Meanwhile, Alibaba has introduced a free '0-account period' service for sellers; the total amount had reached 200 billion RMB by 30 June 2021. Alibaba has also restarted the 'Spring Thunder Project' to help small and medium-sized enterprises (SMEs) to obtain special financial and non-financial support since April 2021. In this regard, if sellers have perceived higher financial pressure during the COVID-19 period and are satisfied with the financial services provided by e-commerce platforms, they will be more likely to continue using the same platform, resulting in higher loyalty.

However, sellers have a decreased dependence on e-commerce platforms if they know that they can attain support from other channels, such as governments. In the face of the pandemic crisis, governments and central banks around the world introduced relief policies to mitigate the negative economic impacts from the pandemic. For example, in the UK, the government announced numerous policies to support businesses and workers. In a normal economic period, government support policies can help firms, especially SMEs, to survive and mitigate the effects of competition with other mature firms. Government financial support policies contribute to innovation activities, operation status and better performance (Cristobal et al., 2007; Howell et al., 2018; Sullivan and Kim, 2018; Temu and Kessy, 2010). During the pandemic, sellers have mainly faced a higher level of financial challenge, which has threatened their survival. If they are familiar with government financial relief policies, they have more chance to reduce their financial risks during this

uncertain period. Thus, sellers with a better perception of COVID-19 government financial support policy will still have more freedom of platform choice, even if they are satisfied with the e-commerce platform's additional financial service. They will not be constrained by one specific platform, which affects their loyalty.

Therefore, we hypothesize that:

**H4:** *Perceived COVID-19 financial pressure positively moderates the effect of e-commerce platform additional financial service satisfaction on e-commerce platform loyalty.*

**H5:** *Sellers' perception of COVID-19 government financial relief policy negatively moderates the effect of e-commerce platform additional financial service satisfaction on e-commerce platform loyalty.*

## **Sample and data collection**

To address our research objectives, we devised an online survey and collected data from a sample of e-commerce sellers on the Taobao platform. This section explains the measurements of the constructs and provides details of the sample and the data collection procedure.

We initially developed our questionnaire in English by adapting existing studies, then modified it to fit our research context and thus ensure content validity. Subsequently, the author team and two interpreters who were familiar with e-commerce translated the questionnaire into Chinese independently. We also asked three sellers and two senior managers of e-commerce companies in China to help verify the relevance and wording of the items in the questionnaire. A pilot study was conducted before the final data collection to validate the face validity of the measurements. Based on feedback from participants in the pretest, we further modified the wording of a few items for a better reflection of the constructs being studied.

A total of 400 questionnaires were sent out in the final stage; 332 were collected,

providing a recovery rate of 83%. After rejecting incomplete surveys, 313 qualified surveys remained.

The details of the sample distribution are presented in Table 1.

[Insert Table 1]

### ***Measurements***

Table 2 lists the items of all the scales used. As mentioned above, the constructs of this study were drawn from existing studies and modified to fit the e-commerce platform financial service research context.

[Insert Table 2]

For independent variables, we followed Parasuraman et al., (2005) to measure *privacy and security quality* and adapted Barnes and Vidgen (2002) to measure *information and reliability quality*; the items for measuring *service quality* were taken from Bauer et al., (2006), while the *product and design quality* measurement was adapted from Ladhari and Leclerc (2013) and Luo et al. (2020).

Adapting the existing research from Parasuraman et al., (2005) and Ladhari and Leclerc (2013), we employed multi-item measurements to measure the dependent variable, *e-commerce platform loyalty*. In addition, we measured *e-commerce platform additional financial service satisfaction* using scales adapted from Bhattacharjee and Premkumar (2004). All items were measured on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

For the moderating effect of perceived financial pressure due to COVID-19, we followed Liu et al., (2021) by asking the participants how they felt about COVID-related financial pressure. This measurement also ranged from 1 (no financial pressure) to 5 (too much financial pressure). Following Feola et al., (2019), we asked participants about the extent to which they were familiar with the government financial relief support specified for COVID-19 (1 = not familiar at all, 5 = very familiar) in order to capture the moderating effect of the perception of COVID-19 government financial relief policy.

We controlled for *firm age*, *firm size*, *yearly income* and *finance situation* by

adopting existing studies.

Structural equation modelling (SEM) allows simultaneous analysis of all variables in a proposed model instead of analyzing them separately (Chin, 1998; Fornell, 1985). As such, we estimated the hypothesized model by using SEM and AMOS 24.0. Prior to this, we conducted explanatory factor analysis (EFA) and confirmatory factor analysis (CFA) in order to confirm the underlying factor structure, because we had employed translation measures from English to Chinese (Desrosiers, 2000; Gao et al., 2020).

#### Reliability and validity

Prior to the main data collection, we carried out a pilot study to test the reliability of the instrument. We conducted the pretest with 30 Taobao sellers and entrepreneurs. The Cronbach's alphas of all variables were found to be greater than the threshold of 0.7, indicating good reliability. As explained earlier, it was demonstrated that the measurements of the constructs had acceptable face and content validity.

EFA was employed to confirm the underlying factor structure. The results of the EFA with principal component extraction and varimax rotation resulted in a six-factor solution. Table 3 shows that the item loadings were between 0.631 to 0.800, which was well above the cut-off. Six factors with Eigen values greater than 1 explained 64.153% of the variance and significantly loaded on their associated factors without high cross-loadings, which was satisfactory for a social science study.

[Insert Table 3]

CFA with six latent factors was performed to evaluate the composite reliability (CR) and convergent and discriminant validity of each construct, as well as the goodness-of-fit of the measurement model. Maximum likelihood estimation was used to test each construct's measurement model; the results are shown in Table 2. The goodness-of-fit statistics were accepted: the values of the comparative fit index (CFI) and Tucker-Lewis index (TLI) were both greater than 0.9. The value of the root mean square error of approximation (RMSEA) was lower than 0.08; the ratio of the chi-square to the degree of freedom (df) was 1.590, which was below the cut-off of 4, indicating the measurement model's good fit with the data (Hu and Bentler, 1999).

The Cronbach's alphas for each construct ranged from 0.769 to 0.807 (Cronbach, 1951); the CRs ranged from 0.765 to 0.805, which was above the required minimum of 0.7, thus confirming that they had an acceptable level of internal consistency, reliability and convergent validity.

The standardized factor loadings were greater than 0.5 (the majority were above 0.7) and were statistically significant. The average variance extracted (AVE) for the individual constructs was above 0.4, and the majority were near to or greater than the threshold of 0.5. Although the AVE of some constructs was  $<0.5$ , their CRs were greater than 0.7, which meant that convergent validity was confirmed (Fornell and Larcker, 1981; Malhotra, 2007). To confirm discriminant validity, we compared the square roots of the AVE of the latent constructs with the correlation coefficients between the constructs. As the square root values were greater, we were able to confirm discriminant validity (Fornell and Larcker, 1981; Hair et al., 2006).

We took several actions to address common method bias (CMB) in our study. First, at the beginning of the survey, we explained to the respondents that there were no right or wrong answers and that their identities, and those of their firms, would be completely anonymized. Second, we randomized the order of the statements regarding the independent, dependent, mediating and moderating variables in order to prevent the participants perceiving any causal directions between the constructs measured (Podsakoff, 2003). The Harman single-factor test also showed that one factor explained 31.897% of the variance,  $<50\%$ , confirming that there was no serious concern about CMB (Harman, 1967; Podsakoff, 2003). Moreover, the goodness-of-fit statistics for the single-factor model were evaluated as follows:  $\chi^2 = 1140.772$  ( $df = 230$ ,  $\chi^2/df = 4.960$ ,  $p < 0.001$ ); RMSEA = 0.113; CFI = 0.653; and TLI = 0.618, indicating that the single-factor model did not have a good fit with the data (Hu and Bentler, 1999). The variance inflation factor for each independent variable was lower than the suggested threshold of 4, suggesting the absence of multicollinearity (Hadi and Chatterjee, 2015).

## Results

Table 4 reports the means, standard deviations, correlations and square roots of the AVE of the variables used in this study.

[Insert Table 4]

Table 5 presents the results for the hypothesized paths. The hypothesized model of direct and indirect relationships had satisfactory model fit:  $\chi^2(303) = 470.862$  ( $p < 0.05$ );  $\chi^2/df = 1.554$ ; CFI = 0.942; IFI = 0.94; TLI = 0.933; and RMSEA = 0.042. The empirical results show that privacy and security quality (PSQ;  $\beta = 0.257$ ,  $p < 0.001$ ), information and reliability quality (IRQ;  $\beta = 0.192$ ,  $p < 0.01$ ) and service quality (SRQ;  $\beta = 0.393$ ,  $p < 0.001$ ) significantly and positively affect e-commerce platform additional financial service satisfaction, which supports H1a, H1b and H1c, respectively.

[Insert Table 5]

The effect of product and design quality (PDQ) on e-commerce platform additional financial service satisfaction (SAT) was not significant ( $\beta = 0.073$ ,  $p > 0.05$ ), thus H1d is rejected. A positive and significant relationship was found between e-commerce platform additional financial service satisfaction and e-commerce platform loyalty (LOY;  $\beta = 0.870$ ,  $p < 0.001$ ), which supports H2.

H3 predicted a mediating effect of e-commerce platform additional financial service satisfaction (SAT) between platform quality and e-commerce platform loyalty (LOY). We carried out a full analysis of the SEM using the bootstrap method. As shown in table 5, the indirect effects, through e-commerce platform additional financial service satisfaction, of privacy and security quality ( $\beta = 0.223$ ,  $p < 0.05$ ), information and reliability quality ( $\beta = 0.167$ ,  $p < 0.05$ ) and service quality ( $\beta = 0.341$ ,  $p < 0.01$ ) on e-commerce platform loyalty were significant. Therefore, H3a, H3b and H3c are supported. As the indirect effect of e-commerce platform additional financial service satisfaction between product and design quality and e-commerce platform loyalty was not significant, H3d is rejected.

We added perceived COVID-19 financial pressure (COV), its interaction item

(COV\*SAT), perception of COVID-19 government financial relief policy (GOV) and its interaction item (GOV\*SAT) to the full model after centring COV, GOV and SAT. Table 5 provides the results of the moderation analysis and shows a good model fit:  $\chi^2(403) = 629.486$  ( $p < 0.05$ );  $\chi^2/df = 1.562$ ; CFI = 0.929; IFI = 0.931; TLI = 0.919; and RMSEA = 0.042. The empirical results show that e-commerce platform additional financial service satisfaction (SAT) and perceived COVID-19 financial pressure (COV) were significantly and positively associated with e-commerce platform loyalty ( $\beta = 0.879$ ,  $p < 0.001$ ;  $\beta = 0.457$ ,  $p < 0.001$ ), and that the interaction had a positive and significant effect on e-commerce platform loyalty ( $\beta = 0.387$ ;  $p < 0.01$ ). Therefore, H4 is supported; the results are clearly observable in figure 2.

In addition, perception of COVID-19 government financial relief policy (GOV) and its interaction were significantly and negatively associated with e-commerce platform loyalty ( $\beta = -0.224$ ,  $p < 0.01$ ;  $\beta = -0.163$ ,  $p < 0.05$ ), while the impact of e-commerce platform additional financial service satisfaction (SAT) was still positive and significant ( $\beta = 0.387$ ;  $p < 0.01$ ). Thus, H5 is also supported (see figure 3).

## **Discussion and implications**

As e-commerce has become increasingly prevalent and competitive in recent times, maintaining platform loyalty has become essential to firms' survival and sustainable development. In contrast to the traditional concept of loyalty in marketing literature, the study of e-loyalty is a more recent phenomenon. Despite its increasing importance in both practice and academia in recent years, there is no consensus as to what contributes to clients' loyalty online (López-Miguens and Vázquez, 2017). Extant research has investigated platform service quality as an antecedent of e-satisfaction and e-loyalty. However, as a major function in the B2B environment and a significant contributor to e-commerce platforms' growth, the role of extended or additional financial services provided by platforms has been largely ignored. This study thus extends the e-commerce literature by addressing the impact of additional financial services on e-satisfaction and e-loyalty from the perspective of sellers.

Alibaba is the leading e-commerce giant in China and has attracted widespread attention in recent years. As it provides the most complete financial support to its sellers, it provided us with an ideal context to examine the above research questions. Furthermore, taking advantage of the ongoing COVID-19 pandemic, we also investigated how the financial pressure faced by firms during the pandemic has moderated the relationship between sellers' satisfaction with additional financial services and their loyalty to the platform. We also considered the impact of government by investigating how firms' perception of governmental financial support has affected the above relationship.

Drawing upon the stimulus—organism—response (S—O—R) model, we have argued that sellers' platform choice is affected by their emotional perception of the platform. Meanwhile, this internal emotion is influenced by external stimuli. In our context, the quality of additional financial services constitutes this stimuli. Specifically, we identified four dimensions for measuring the quality of additional financial services provided by the e-commerce platform – privacy and security quality, information and reliability quality, service quality and product and design quality – which we treated as the stimulating factors (S). We then considered sellers' satisfaction with the additional service quality to be the 'organism' (O) and treated sellers' loyalty towards the platform as customers' 'response' (R). Based on the S-O-R model, we predicted that the four quality dimensions of a platform's additional financial service will affect how sellers (clients of the platform) perceive the platform, which will in turn influence their final behaviour response, i.e. their choice of whether to maintain a long-term relationship with the platform (remain loyal) or transfer to another platform. We also incorporated these quality variables into our model as mediating factors in order to investigate how financial service quality can help to increase sellers' satisfaction with the financial service and encourage them to remain loyal to the platform.

Using first-hand survey data collected from 313 Taobao sellers, our results demonstrate that higher financial service quality provided by an e-commerce platform is positively correlated to a higher likelihood that sellers will remain loyal to the

platform. We found that sellers will be more satisfied with a platform's additional financial services if the service demonstrates better quality in terms of privacy and security, information and reliability and service provision. However, we also found that product and design quality was not a significant factor, contrary to our expectation. Consistent with prior studies, we have also demonstrated the significant impact of e-satisfaction on e-loyalty. Specifically, we found that sellers' satisfaction with additional financial service quality will make them more inclined to establish and continue a long-term relationship with their existing platform instead of changing to a new one. This is also consistent with the S-O-R model, which argues that an internal mechanism translates the external stimulus into a behavioural response through a psychological process. As higher service quality fulfils sellers' expectation of the platform, their resulting positive emotional state leads to a positive behavioural response. Thus, the mediating effect of additional financial service satisfaction on the relationship between service quality and platform loyalty is also supported.

Additionally, the two moderating effects are also evidenced. Our results demonstrate the positive moderating effect of perceived COVID-related financial pressure. They indicate that when sellers have faced more financial pressure during the pandemic, it has been more likely that their satisfaction with the platform's additional financial service will translate into higher platform loyalty. On the contrary, a negative moderating effect was found for COVID-related government financial relief policy. The results suggest that when sellers are aware of relevant government financial support, they will be less dependent on the platform to raise funding and thus have more freedom of choice over which platform to join. This in turn decreases their loyalty to the platform. Under these conditions, as sellers face less constraints in gaining capital, their satisfaction with the financial service provided by the e-commerce platform is less important in terms of retaining them as loyal clients.

This study has the following implications. First, we have evidenced that additional services could be an influential factor in the success of e-commerce platforms. We have found that high quality additional services can generally increase sellers' satisfaction and thus enhance their likelihood of staying with the platform.

Therefore, providing additional platform services could serve as a way to attract potential platform participants. Furthermore, as sellers are most concerned with privacy and security, information and reliability and service provision when using a platform service, it is suggested that e-commerce platforms ensure and strengthen these aspects of their additional platform services, as when sellers are more satisfied with the service provided, it will prolong their participation in the platform. Second, sellers are encouraged to take advantage of the services provided by the platform in order to ease external environmental uncertainties and challenges.

Finally, our results also shed light on institutions and policy makers. Policies always exert influential impact on the development of enterprises; this is particularly true for small and medium-sized businesses. When these small sellers have limited access to capital from traditional financial institutions, they have to rely on e-commerce platforms (or any other available channels) for funding, which limits their choice of platform. As a result, a platform that can provide such financial support has substantial bargaining power over sellers within the B2B system. This imbalance between the platform and its participants may lead to an unhealthy and unstable business environment in the long run. Thus, governments and institutions should provide more financial support to sellers (small and micro enterprises) in order to foster a sustainable business environment, which would also help to prevent monopolization by a small number of platforms.

## **Limitations and future research**

Although this study has used a new angle to examine e-satisfaction and e-loyalty, we also acknowledge some limitations. First, the study only used Alibaba as a sample company, which somewhat limits the generalization of the outcome. For future research, it would be interesting to include other companies and thus enrich the sampling. Second, this data set is only cross-sectional and does not take into consideration the changing trends of e-commerce over time. To improve this aspect, a longitudinal data set could be gathered in order to ascertain the changing phenomenon

of loyalty in e-commerce over time. Meanwhile, while our research has investigated the quality of financial services in four dimensions, future research could explore financial service quality by utilizing different measures. Third, this study has only focused on e-commerce in China. As China has a specific institutional environment that affects e-commerce business, it thus limits the comparability of this study. It would be interesting to conduct cross-country studies in order to examine how the relationship between e-loyalty and e-satisfaction differs across various institutional environments.

## **Conclusion**

This paper aimed to investigate how additional financial services provided by e-commerce platforms affect clients' loyalty to the platform from sellers' perspective. We employed the stimulus—organism—response (S—O—R) model, conceptualizing the quality of additional financial services as the external stimulus, and explored how these services affect sellers' response, i.e. their choice of whether to remain loyal to the platform, by influencing their satisfaction with the service provided. We also looked at the way COVID-19 has affected the above relationship as it has imposed extreme financial pressure on these SMEs. Sellers' perception of government financial support was also considered as a moderating variable of the above relationship. Our results will be enlightening for both platforms and policy makers.

## Reference

- Akinci, S., Aksoy, Ş., Atilgan, E., 2004. Adoption of internet banking among sophisticated consumer segments in an advanced developing country. *Int. J. Bank Mark.*
- Aladwani, A.M., Palvia, P.C., 2002. Developing and validating an instrument for measuring user-perceived web quality. *Inf. Manage.* 39, 467–476.
- Albarq, A.N., 2021. Effect of Web atmospherics and satisfaction on purchase behavior: stimulus–organism–response model. *Future Bus. J.* 7, 1–8.
- Anderson, E., Weitz, B., 1992. The use of pledges to build and sustain commitment in distribution channels. *J. Mark. Res.* 29, 18–34.
- Barnes, S.J., Vidgen, R.T., 2002. Assessing e-commerce quality with WebQual: An evaluation of the usability, information quality, and interaction quality of Internet bookstores. *J. Electron. Commer. Res.* 3, 114–127.
- Bauer, H.H., Falk, T., Hammerschmidt, M., 2006. eTransQual: A transaction process-based approach for capturing service quality in online shopping. *J. Bus. Res.* 59, 866–875.
- Bhattacharjee, A., Premkumar, G., 2004. Understanding changes in belief and attitude toward information technology usage: A theoretical model and longitudinal test. *MIS Q.* 229–254.
- Buell, R.W., Kim, T., Tsay, C.-J., 2017. Creating reciprocal value through operational transparency. *Manag. Sci.* 63, 1673–1695.
- Cai, Y.-J., Wang, Y., Zhang, J., 2020. Enhancing e-platform business by customer service systems: a multi-methodological case study on Ali Wangwang instant message’s impacts on TaoBao. *Ann. Oper. Res.* 291, 59–81.
- Chang, H.H., Tsai, Y.-C., Chen, S.-H., Huang, G.-H., Tseng, Y.H., 2015. Building long-term partnerships by certificate implementation: A social exchange theory perspective. *J. Bus. Ind. Mark.*
- Chevalier, Stephanie, 2022. “Retail e-commerce sales worldwide from 2014 to 2021, with forecasts from 2022 to 2025”. Statista, 26 August.

<https://www.statista.com/statistics/379046/worldwide-retail-e-commerce-sales/#statisticContainer>

Chin, W.W., 1998. The partial least squares approach to structural equation modeling. *Mod. Methods Bus. Res.* 295, 295–336.

Clemes, M.D., Gan, C., Du, J., 2012. The factors impacting on customers' decisions to adopt Internet banking. *Banks Bank Syst.* 33–50.

Collier, J.E., Bienstock, C.C., 2006. Measuring service quality in e-retailing. *J. Serv. Res.* 8, 260–275.

Connolly, R., Bannister, F., Kearney, A., 2010. Government website service quality: A study of the Irish revenue online service. *Eur. J. Inf. Syst.* 19, 649–667.

Cristobal, E., Flavian, C., Guinaliu, M., 2007. Perceived e-service quality (PeSQ): Measurement validation and effects on consumer satisfaction and web site loyalty. *Manag. Serv. Qual. Int. J.*

Cronbach, L.J., 1951. Coefficient alpha and the internal structure of tests. *psychometrika* 16, 297–334.

Desrosiers, D.B.P., 2000. Translating questionnaires and inventories using a cross-cultural translation technique. *J. Teach. Phys. Educ.* 19, 374–387.

Eroglu, S.A., Machleit, K.A., Davis, L.M., 2001. Atmospheric qualities of online retailing: A conceptual model and implications. *J. Bus. Res.* 54, 177–184.

Fassnacht, M., Köse, I., 2007. Consequences of web-based service quality: uncovering a multi-faceted chain of effects. *J. Interact. Mark.* 21, 35–54.

Fornell, C., 1985. A second generation of multivariate analysis: Classification of methods and implications for marketing research.

Fornell, C., Larcker, D.F., 1981. Evaluating structural equation models with unobservable variables and measurement error. *J. Mark. Res.* 18, 39–50.

Gao, Y., Dai, H., Jia, G., Liang, C., Tong, T., Zhang, Z., Song, R., Wang, Q., Zhu, Y., 2020. Translation of the Chinese version of the Nomophobia questionnaire and its validation among college students: factor analysis. *JMIR MHealth UHealth* 8, e13561.

Gummerus, J., von Koskull, C., Kowalkowski, C., 2017. Guest editorial:

relationship marketing—past, present and future. *J. Serv. Mark.*

Hadi, A.S., Chatterjee, S., 2015. *Regression analysis by example*. John Wiley & Sons.

Hair, J., Black, B., Babin, B., Anderson, R., Tatham, R., 2006. *Multivariate data analysis: With readings*. Oklahoma.

Harman, D., 1967. A single factor test of common method variance. *J. Psychol.* 35, 359–378.

Howell, A., He, C., Yang, R., Fan, C.C., 2018. Agglomeration,(un)-related variety and new firm survival in China: Do local subsidies matter? *Pap. Reg. Sci.* 97, 485–500.

Hu, L., Bentler, P.M., 1999. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct. Equ. Model. Multidiscip. J.* 6, 1–55.

Ibrahim, E.E., Joseph, M., Ibeh, K.I., 2006. Customers' perception of electronic service delivery in the UK retail banking sector. *Int. J. Bank Mark.*

Janita, M.S., Miranda, F.J., 2013. The antecedents of client loyalty in business-to-business (B2B) electronic marketplaces. *Ind. Mark. Manag.* 42, 814–823.

Jun, M., Cai, S., 2001. The key determinants of internet banking service quality: a content analysis. *Int. J. Bank Mark.*

Kim, J.-H., Kim, M., Kandampully, J., 2011. The impact of E-Retail environment characteristics on E-Satisfaction and purchase intent. *Int. J. Serv. Sci. Manag. Eng. Technol. IJSSMET* 2, 1–19.

Laato, S., Islam, A.N., Islam, M.N., Whelan, E., 2020. What drives unverified information sharing and cyberchondria during the COVID-19 pandemic? *Eur. J. Inf. Syst.* 29, 288–305.

Ladhari, R., Leclerc, A., 2013. Building loyalty with online financial services customers: Is there a gender difference? *J. Retail. Consum. Serv.* 20, 560–569.

Leung, C.C., Lam, T.H., Cheng, K.K., 2020. Mass masking in the COVID-19 epidemic: people need guidance. *Lancet* 395, 945.

Li, F., Lu, H., Hou, M., Cui, K., Darbandi, M., 2021. Customer satisfaction with

bank services: The role of cloud services, security, e-learning and service quality. *Technol. Soc.* 64, 101487.

Li, S., Liu, Y., Bandyopadhyay, S., 2010. Network effects in online two-sided market platforms: A research note. *Decis. Support Syst.* 49, 245–249. <https://doi.org/10.1016/j.dss.2010.02.004>

Lin, G.T., Sun, C.-C., 2009. Factors influencing satisfaction and loyalty in online shopping: an integrated model. *Online Inf. Rev.*

Liu, H., Liu, W., Yoganathan, V., Osburg, V.-S., 2021. COVID-19 information overload and generation Z's social media discontinuance intention during the pandemic lockdown. *Technol. Forecast. Soc. Change* 166, 120600.

López-Miguens, M.J., Vázquez, E.G., 2017. An integral model of e-loyalty from the consumer's perspective. *Comput. Hum. Behav.* 72, 397–411. <https://doi.org/10.1016/j.chb.2017.02.003>

Luo, N., Wang, Y., Zhang, M., Niu, T., Tu, J., 2020. Integrating community and e-commerce to build a trusted online second-hand platform: Based on the perspective of social capital. *Technol. Forecast. Soc. Change* 153, 119913.

Ma, Yihan. 2022. "E-commerce in China - statistics & facts". Statista, 26 August. <https://www.statista.com/topics/1007/e-commerce-in-china/#dossierKeyfigures>

Malhotra, N., 2007. *Marketing Research: An Applied Orientation and SPSS 14.0 Student CD*.

Mazaheri, E., Richard, M.-O., Laroche, M., 2011. Online consumer behavior: Comparing Canadian and Chinese website visitors. *J. Bus. Res.* 64, 958–965.

Mohan, G., Sivakumaran, B., Sharma, P., 2013. Impact of store environment on impulse buying behavior. *Eur. J. Mark.*

Morgan, R.M., Hunt, S.D., 1994. The commitment-trust theory of relationship marketing. *J. Mark.* 58, 20–38.

Narayanasamy, K., Rasiah, D., Tan, T.M., 2011. The adoption and concerns of e-finance in Malaysia. *Electron. Commer. Res.* 11, 383–400.

Parasuraman, A., Zeithaml, V.A., Malhotra, A., 2005. ES-QUAL: A multiple-item scale for assessing electronic service quality. *J. Serv. Res.* 7, 213–233.

Podsakoff, N.P., 2003. Common method biases in behavioral research: A critical review of the literature and recommended remedies. *J. Appl. Psychol.* 88, 879–903.

Purcell, F., Toland, J., 2003. E-Finance for Development: Global Trends, National Experience and SMEs. *Electron. J. Inf. Syst. Dev. Ctries.* 11, 1–4.

Reichheld, F.F., Scheffer, P., 2000. E-loyalty: your secret weapon on the web. *Harv. Bus. Rev.* 78, 105–113.

Roson, R., 2005. Two-Sided Markets: A Tentative Survey. *Rev. Netw. Econ.* 4. <https://doi.org/10.2202/1446-9022.1070>

Russell, J.A., Mehrabian, A., 1974. Distinguishing anger and anxiety in terms of emotional response factors. *J. Consult. Clin. Psychol.* 42, 79.

Semeijn, J., van Riel, A.C., van Birgelen, M.J., Streukens, S., 2005. E-services and offline fulfilment: how e-loyalty is created. *Manag. Serv. Qual. Int. J.*

Shatnawi, Y., Al-Faouri, E.H., Al-Hayari, M., 2019. Examining the direct and moderation effect of psychographic and demographic factors on green purchasing behaviour. *Glob. Bus. Econ. Rev.* 21, 556–582.

Srinivasan, S.S., Anderson, R., Ponnnavolu, K., 2002. Customer loyalty in e-commerce: an exploration of its antecedents and consequences. *J. Retail.* 78, 41–50.

Sullivan, Y.W., Kim, D.J., 2018. Assessing the effects of consumers' product evaluations and trust on repurchase intention in e-commerce environments. *Int. J. Inf. Manag.* 39, 199–219.

Temu, S.S., Kessy, S., 2010. The impact of training on performance of micro and small enterprises served by microfinance institutions in Tanzania.

Van Dyke, T.P., Kappelman, L.A., Prybutok, V.R., 1997. Measuring information systems service quality: concerns on the use of the SERVQUAL questionnaire. *MIS Q.* 195–208.

Vieira, V.A., 2013. Stimuli–organism–response framework: A meta-analytic review in the store environment. *J. Bus. Res.* 66, 1420–1426.

Viio, P., Grönroos, C., 2016. How buyer–seller relationship orientation affects adaptation of sales processes to the buying process. *Ind. Mark. Manag.* 52, 37–46.

Wolfenbarger, M., Gilly, M.C., 2003. eTailQ: dimensionalizing, measuring and

predicting etail quality. *J. Retail.* 79, 183–198.

Wu, K.-W., Huang, S.Y., Yen, D.C., Popova, I., 2012. The effect of online privacy policy on consumer privacy concern and trust. *Comput. Hum. Behav.* 28, 889–897.

Xu, J., Benbasat, I., Cenfetelli, R.T., 2014. The nature and consequences of trade-off transparency in the context of recommendation agents. *MIS Q.* 38, 379–406.

Yang, Z., Cai, S., Zhou, Z., Zhou, N., 2005. Development and validation of an instrument to measure user perceived service quality of information presenting web portals. *Inf. Manage.* 42, 575–589.

## Appendix

**Table 1** Sample characteristics

Category		Frequency	Percentage
<b>Firm age</b>	Less than 12 months	21	6.71%
	12 to 36 months	154	49.20%
	37 to 60 months	79	25.24%
	More than 60 months	59	18.85%
<b>Firm size</b>	Less than 10 full-time employees	76	24.28%
	11 to 50 full-time employees	125	39.94%
	51 to 100 full-time employees	65	20.77%
	101 to 300 full-time employees	36	11.50%
	More than 300 full-time employees	11	3.51%
<b>Yearly income</b>	Less than 1 million RMB	95	30.35%
	1 to 5 million RMB	127	40.58%
	5 to 10 million RMB	61	19.49%
	More than 10 million RMB	30	9.58%
<b>Sales category</b>	Skin care	135	43.13%
	Electronic consumption	25	7.99%
	Clothing	66	21.09%
	Children's toy	21	6.71%
	Household appliances	9	2.88%
	Maternal and child supplies	10	3.19%
	Agricultural and sideline products	16	5.11%
	Drinks	6	1.92%
	Fresh food	14	4.47%
	Precious metals	3	0.96%
	Others	8	2.56%
<b>How many years is your company under the loss in the recent three years?</b>	0	115	36.74%
	1	159	50.80%
	2	35	11.18%
	3	4	1.28%

N=313.

**Table 2** Measurement items and confirmatory factor analysis results

<b>Constructs and items</b>	<b><math>\lambda</math></b>
<b>The privacy and security quality (PSQ; <math>\alpha = 0.767</math>; CR = 0.765; AVE = 0.451)</b>	
I feel safe when I provide sensitive information to the financial service of Ali.	.7 66
I believe that the financial service of Ali has enough safeguards to implement transaction activities.	.6 67
I believe that our financial information is protected by Ali.	.6 21
I believe that the financial service of Ali formulated detailed security transaction specifications.	.6 30
<b>The information and reliability quality (IRQ; <math>\alpha = 0.782</math>; CR = 0.791; AVE = 0.487)</b>	
The financial service of Ali shows accurate information about the services.	.7 04
The financial service of Ali provides easy-to-understand information.	.6 95
The financial service of Ali provides detailed information.	.6 21
The financial service of Ali provides timely information.	.7 62
<b>The service quality (SRQ; <math>\alpha = 0.796</math>; CR = 0.797; AVE = 0.496)</b>	
The financial service of Ali responds to queries in a timely manner.	.7 39
The financial service of Ali has interactive feedback mechanism.	.7 27
The financial service of Ali has empathy with users' problems.	.6 46
The financial service of Ali exactly as promised.	.7 02

**The product and design quality (PDQ;  $\alpha = 0.807$ ; CR = 0.805; AVE = 0.509)**

The financial service of Ali enables us to get on to it quickly.	.6
	35
The financial service of Ali offers clear menu items on each page.	.7
	05
The financial service of Ali is simple to use.	.7
	42
The financial service of Ali is well organized.	.7
	81

**The e-commerce platform additional financial service satisfaction (SAT;  $\alpha = 0.794$ ; CR = 0.803; AVE = 0.506)**

I am satisfied with the experience of using the financial service of Ali.	.7
	41
I am pleased with the experience of using the financial service of Ali.	.7
	02
I am delighted with the experience of using the financial service of Ali.	.6
	29
My feeling about using the financial service of Ali is good.	.7
	64

**The e-commerce platform loyalty (LOY;  $\alpha = 0.769$ ; CR = 0.775; AVE = 0.535)**

I will continue to do business on Ali rather than shut down the business.	.7
	80
I am willing to recommend other entrepreneurs to do business on Ali.	.6
	75
I say positive things about Ali platform.	.7
	34

Model fit statistics:  $\chi^2$  (215) = 341.806 ( $p < 0.05$ );  $\chi^2/df = 1.590$ ; CFI = 0.952; IFI = 0.952; TLI = 0.943; RMSEA = 0.042.

**Perceived COVID-19 financial pressure (COV)**

Because of COVID-19, I feel... (No financial pressure --- Too much financial pressure)

**Perceived COVID-19 government financial relief policy (GOV)**

To the extent of the familiar with the government financial relief policy about COVID-19 for business... (Not familiar at all --- Very familiar)

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**Table 3** Exploratory factor analysis results

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Rotated component matrix <sup>a</sup>

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Model construct	Measurement item	Varimax-rotated loadings factor					
		1	2	3	4	5	6
The product and design quality (PDQ)	PDQ1	<b>.781</b>					
	PDQ2	<b>.751</b>					
	PDQ3	<b>.747</b>					
	PDQ4	<b>.737</b>					

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The	SAT1						<b>.738</b>
e-commerce	SAT2						<b>.640</b>
platform	SAT3						<b>.704</b>
additional	SAT4						<b>.782</b>
financial service							
satisfaction							
(SAT)							
The service	SRQ1						<b>.788</b>
quality (SRQ)	SRQ2						<b>.644</b>
	SRQ3						<b>.710</b>
	SRQ4						<b>.645</b>
The information	IRQ1					<b>.779</b>	
and reliability	IRQ2					<b>.617</b>	
quality (IRQ)	IRQ3					<b>.736</b>	
	IRQ4					<b>.733</b>	
The privacy and	PSQ1						<b>.800</b>
security quality	PSQ2						<b>.631</b>
(PSQ)	PSQ3						<b>.737</b>
	PSQ4						<b>.659</b>
The	LOY1						<b>.788</b>
e-commerce	LOY2						<b>.694</b>
platform loyalty	LOY3						<b>.774</b>
(LOY)							
Sum of squares (eigenvalue)		2.678	2.625	2.535	2.444	2.345	2.128
Cumulative variance explained		11.642	23.056	34.079	44.704	54.900	64.153
(%)							

Extraction method: principal component analysis. Rotation method: varimax with Kaiser normalization.

**Numbers in bold** are the factor loadings for each component.

<sup>a</sup> Rotation converged in 6 iterations.

**Table 4** Means, standard deviations, and correlations

Variables	M	S	1	2	3	4	5	6	7	8
		D								
The privacy and security quality (PSQ)	4.07	.68	.67							
The information and reliability quality (IRQ)	4.01	.70	.40**	.70						
The service quality (SRQ)	4.13	.73	.45**	.43**	.70					
The product and design quality (PDQ)	3.92	.72	.28**	.41**	.39**	.71				
The e-commerce platform additional financial service satisfaction (SAT)	4.13	.64	.49**	.455*	.55**	.29**	.71			
The e-commerce platform loyalty (LOY)	4.19	.69	.37**	.41**	.46**	.41**	.31**	.73		
Perceived COVID-19 financial pressure (COV)	3.48	.90	.09	.14*	.16**	.09	.15**	.39**	1	
Perceived COVID-19 government financial relief policy (GOV)	3.39	.89	-.05	.00	-0.05	-0.07	-0.07	-0.03	.41**	1

N = 313; \* =  $p < 0.05$ ; \*\* =  $p < 0.01$ . **Numbers in bold** are the square root of AVE.

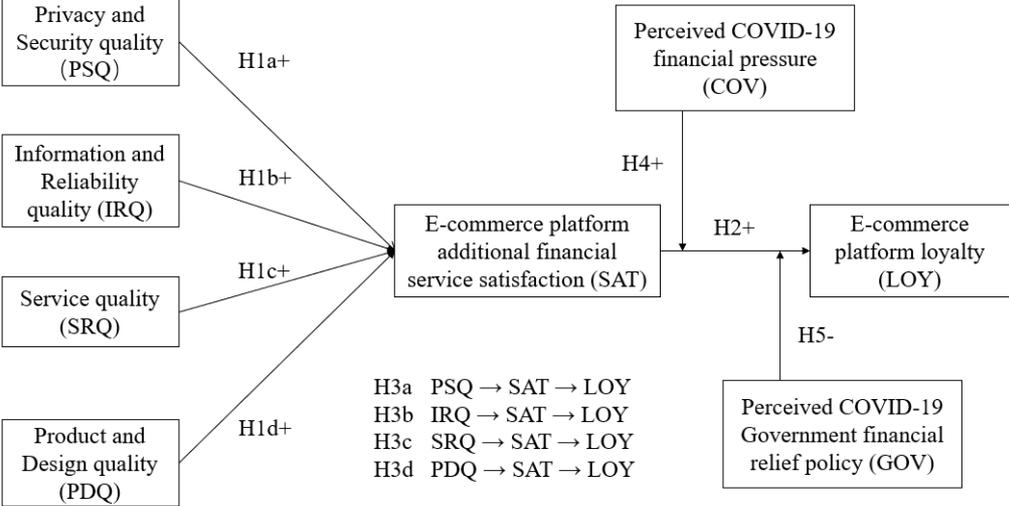
**Table 5** Results of structural equation models

Hypothesis	Hypothesized paths	Path coefficient	Result
H1a	PSQ → SAT	0.257***	Support
H1b	IRQ → SAT	0.192**	Support
H1c	SRQ → SAT	0.393***	Support
H1d	PDQ → SAT	0.073ns	Reject
H2	SAT → LOY	0.870***	Support
H3a	PSQ → SAT → LOY	0.223*	Support
H3b	IRQ → SAT → LOY	0.167*	Support
H3c	SRQ → SAT → LOY	0.341**	Support
H3d	PDQ → SAT → LOY	0.063ns	Reject
Model fit statistics: $\chi^2(303) = 470.862$ ( $p < 0.05$ ); $\chi^2/df = 1.554$ ; CFI = 0.942; IFI = 0.943; TLI = 0.933; RMSEA = 0.042. Tested using the bootstrapping method.			
H4	SAT → LOY	0.879***	Support
	COV → LOY	0.457***	Support
	SAT*COV → LOY	0.387**	Support
H5	SAT → LOY	0.879***	Support
	GOV → LOY	-0.224**	Support
	SAT*GOV → LOY	-0.163*	Support
Model fit statistics: $\chi^2(403) = 629.486$ ( $p < 0.05$ ); $\chi^2/df = 1.562$ ; CFI = 0.929; IFI = 0.931; TLI = 0.919; RMSEA = 0.042.			

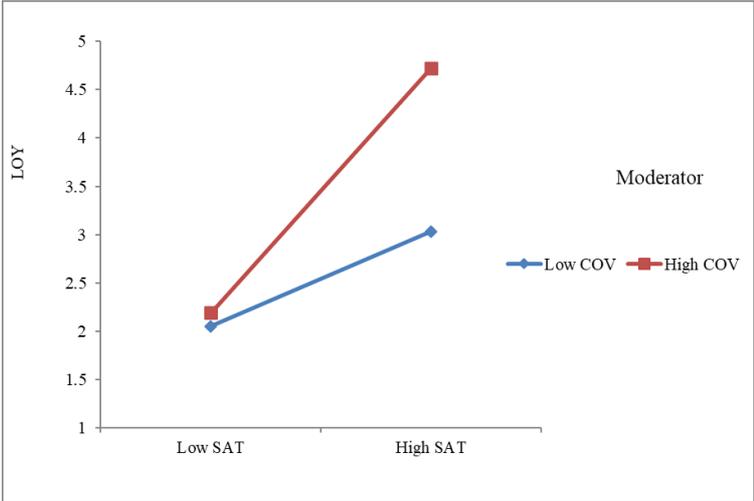
Note: \* =  $p < 0.05$ ; \*\* =  $p < 0.01$ ; \*\*\* =  $p < 0.001$ ; ns = not significant.

PSQ = The privacy and security quality; SAT = The e-commerce platform additional financial service satisfaction; IRQ = The information and reliability quality; SRQ = The service quality; PDQ = The product and design quality; LOY = The e-commerce platform loyalty; COV = Perceived COVID-19 financial pressure; GOV = Perceived COVID-19 government financial relief policy.

**Figure 1** Conceptual framework and hypothesized model



**Figure 2** Moderating relationship of COV



**Figure 3** Moderating relationship of GOV

