Investment decisions regarding internet financial products considering network externalities: a mixed-method approach

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Abstract

Purpose – This study aims to provide an in-depth understanding of investors' cognition and decision-making process with regard to internet financial products. The objective is to effectively guide users' rational investments.

Design/methodology/approach – First, based on grounded theory, this study develops a tool for measuring users' perceived value (PV) of internet financial products via in-depth interviews. Then, after comprehensively considering users' environmental, individual and psychological characteristics, this study proposes a theoretical model of internet financial product investment decisions based on the PV of users. Finally, an empirical study is conducted on 693 valid sample data from e-commerce and online banking financial platforms.

Findings – The empirical results suggest that network externalities influence users' financial behavior by herding (HE) (imitating others and discounting their own information) and PV. PV and HE are key factors in users' investment decisions with regard to internet financial products. Moreover, users' self-efficacy (SE) and platform type play moderate roles in the influence mechanism.

Practical implications – The research conclusions provide valuable references for designing financial products and establishing regulatory rules, which will help the internet financial industry to grow soundly and innovatively.

Originality/value – This study uncovers the mediating effect of HE and PV between network externalities and users' investment intentions in the context of internet financial products. In addition, the moderating effect of users' SE and platform types is revealed.

Keywords Network externalities, Internet financial products, Grounded theory, Perceived value, Herding

Paper type Research paper

1. Introduction

As an innovative mode of financial technology (FinTech), internet finance combines traditional finance with advanced digital technologies, such as big data, cloud computing and artificial intelligence, to provide diversified financial services to users (Hendershott, Zhang, Zhao, & Zheng, 2021). Financial products issued online by internet companies or commercial

banks are called "internet financial products" and are purchased by consumers online. With low thresholds, high returns and good liquidity (Milian, Spinola, & Carvalho, 2019), such products highlight personalized, efficient, transparent and convenient financial planning (Ozili, 2018), and open the door to equal and inclusive finance for the majority of low-income, long-tail people. The number of internet wealth management users in China has continued to grow, rising from 240 million in 2015 to 630 million in 2021, an increase of more than 1.6 times (iiMedia Research, 2021). The explosive growth has ushered in new development opportunities for China's internet and financial industries, and the innovation of internet finance and its products has emerged as a research hotspot in this field in China.

An internet financial product is a kind of financial product that integrates network attributes. It relies on financial platforms (or online banking) to display and transfer relevant information to users. As the user base expands and financial value-added services deepens, the internet financial products present a network effect different from that of traditional products (Manser Payne, Peltier, & Barger, 2021). The extreme market phenomenon of the Matthew effect (strengthening the strong and weakening the weak) is likely to occur, which reflects the positive impact of products or services with external characteristics on users. It is a positive feedback mechanism of increasing returns realized by the scale of the economy on the demand side (Katz & Shapiro, 1985). This network effect determines that the scale of financial users and financial value-added services are crucial to strengthening the competitive advantage of internet financial enterprises in the market (Lee & Kim, 2020; Chen, Hu, & Ben, 2021). Compared with the traditional financial market, the internet financial market is more unstable because the information related to financial products spreads faster on internet financial platforms, and so does information sharing among users. Also, investor sentiment is more volatile and contagious, and prone to generate "herding" (HE) (Chen, Qian, Jin, Xu, & Song, 2020). Once financial risks occur, runs are more likely to happen, and the scope of influence will be broader.

Until now, research on internet financial behaviors has mainly been based on the theory of planned behavior and the technology acceptance model (TAM). For example, Wang (2021) used the TAM to investigate users' internet financial behavioral intention (BI) and identified perceived trust and perceived privacy as the core factors affecting users' BIs. Nan, Kim, Park, and Kim (2020) found that perceived usefulness, security and enjoyment affected users' intentions to continue using mobile payment services by influencing their satisfaction levels. Through the analysis of various perspectives, one can find that the factors that affect individuals' willingness to adopt internet financial services include perceived value (PV), self-efficacy (SE), behavioral attitude, perceived benefits, convenience, subjective norms and individual technical experience (Shanmuganathan, 2020; Feyen, Alonso Gispert, Kliatskova, & Mare, 2021; Salem, 2019; Nguyen, Gallery, & Newton, 2016; Lee, Ryu, & Lee, 2019; Luna, Liébana-Cabanillas, Sánchez-Fernández, & Muñoz-Leiva, 2019; Yang, Lu, Gupta, Cao, & Zhang, 2012; Karjaluoto, Shaikh, Saarijärvi, & Saraniemi, 2019; Manser Payne, Peltier, & Barger, 2018). However, most of these studies have focused on the perspective of individual users, while ignoring the role played by perceptional differences, financial experience and the HE brought about by the financial environment and user interactions in individuals' internet financial behavior decision-making. At the same time, the key content of internet financial products has been neither clearly elaborated nor analyzed in existing studies (Nan *et al.*, 2020; Luna *et al.*, 2019), and there are few systematic explorations of the specific content of user-PV based on internet financial products from a qualitative perspective.

In view of the abovementioned research deficiencies, this study innovatively proposes focusing on two typical platforms, namely e-commerce and online banking financial platforms. This study investigates the network characteristics of the internet financial market, as well as the interactions between individual perceptions and BIs from the perspective of financial users. Additionally, this study probes into the influencing factors and

transmission mechanism that affect the internet financial behavior of users from the perspectives of environmental and individual characteristics, user psychology and different platforms. The main contributions are as follows. First, based on grounded theory, this study explores the measurement tools of the PV of users in internet wealth management, with a greater focus on users' perception characteristics. This lays the foundation for subsequent research on their financial behaviors. Second, this study analyzes the cognitive processes and behavioral patterns of users, and studies the impact of PV, HE and network externalities on their behavior. This approach is conducive to proposing an empirical model and related research theories of individual internet finance that are in line with actual scenarios. In this way, the related issues can be explained scientifically, which can compensate for the insufficiency of existing studies on consumers' purchase behaviors with regard to internet financial products. This approach also opens up a new perspective for research on internet financial behavior.

2. Theoretical background

2.1 Network externalities

Network externalities are explained as follows: "The value or effect that users obtain from a product or service will bring about more value to consumers with the increase of users, complementary products, or services." (Katz & Shapiro, 1985). Network externalities are an important feature that distinguishes the information and communication technology industry from other industries (Cen & Li, 2019). Some studies have analyzed the impact of network externalities on the adoption of information technology (IT) from the perspective of economics (Chiu, Cheng, Huang, & Chen, 2013; Lin, Tsai, Wang, & Chiu, 2011; Zhou & Lu, 2011; Zhang, Li, Wu, & Li, 2017). Researchers believe that network externalities can be divided into two categories: direct and indirect. Direct network externality refers to the added value that users gain from a certain product or service, which is related to the scale of users of that product or service (Gong, Zhang, Chen, Cheung, & Lee, 2019; Zhang et al., 2017). A rise in the number of new users will lead to an increase in the perceived utility of other users, reflecting the network size effect. Indirect network externality is the value resulting from the increase in the number of compatible, complementary products for a product or service with the expansion of its user base (Chiu et al., 2013; Lin & Bhattacherjee, 2008; Zhou & Lu, 2011).

Past studies on users' behavior of adopting IT have used referent network (RN) size and perceived complementarity (PC) to reflect network externalities (Chiu et al., 2013; Lin & Bhattacherjee, 2008; Qasim & Abu-Shanab, 2016). The direct network externalities are measured by RN size, which reflects the number of users who perceive the adoption of the same technology in their social circle. PC presents indirect network externalities, meaning that, with the expansion of the user base, users can obtain many complementary functions and services that provide additional value (Chiu et al., 2013; Zhao & Lu, 2012). When the number of users reaches the critical mass, network externalities arise and new users are attracted. As the internet financial platform is a transaction-based information system, diversified financial products and a large user base are key factors determining its success. From the perspective of network externalities, internet financial platforms with varied products and supporting services can attract more users, and as users increase, fund companies and banks will issue more products on such platforms. Therefore, diversified products, services and member scales are the three factors promoting network externalities (Lin & Bhattacherjee, 2008).

Based on the perspective of user perception, this research reflects the individual perception of network externalities in the internet financial scenario through RN size and PC. The RN size reflects the local network size perceived by users (Zhang et al., 2017) and the number of people purchasing similar financial products on the same financial platform in

their social circle. PC reflects the complementary functions or services of internet financial products. The user base of internet financial platforms and the richness of compatible products and services reflect the coverage of internet financial platforms and user perception, as well as the interaction network of financial platforms.

2.2 Herding (HE)

In this study, HE refers to the phenomenon wherein people tend to discount or even not use the information that they possess when making decisions; rather, they choose to imitate others (Banerjee, 1992). In the financial market, the asymmetry of available information may lead to the HE of investors (Bikhchandani, Hirshleifer, & Welch, 1998; Burtch, 2011), who imitate others and make decisions that go against their initial plans, as imitation is an instinct in human development (Kim & Petrick, 2021). Such acts will greatly aggravate the self-reinforcement of financial market deviations and lead to financial markets volatility (Jiang, Ho, Yan, & Tan, 2018). To explain the anomaly in traditional financial markets, the phenomenon of HE has been studied by scholars as a branch of behavioral finance theory (Bikhchandani *et al.*, 1998). Because internet financial products are, in essence, still financial products, HE is introduced in this paper to explain the behavioral process that affects users' financial behavior.

There are two types of HEs: imitating others (IO) and discounting one's own information (DOI) (Sun, 2013). In practice, IO refers to the degree to which a person will follow others' decisions when adopting a technology (Hong, Cao, & Wang, 2017). DOI denotes the degree to which a person disregards their own beliefs about a technology when making an adoption decision (Sun, 2013). On the basis of the uniqueness of the internet finance field and its users (Zhang & Chen, 2017), this research performs the dimensional division of HE based on the internal and external levels of impact. Of the two, the external impact (IO) indicates that users observe others' purchase actions and make the same investment decisions, essentially following the majority. In other words, they make financial decisions through behavioral observation in the consumption scene of the financial platform. On the other hand, DOI is an internalization process caused by HE, i.e. users reduce their sensitivity to their own information and judgment in the wealth management process and make financial decisions after observing others' decisions and the information released by the platform. When investing in internet financial products, some users vacillate among different types of products because their financial knowledge is limited and their risk preferences differ (Karjaluoto *et al.*, 2019). By imitating the investment decisions of others and discounting their own information, they rely on the product ranking released by the platform and others' interactions in the comment area, blindly follow the crowd and exhibit shortsighted behaviors, i.e. they make irrational investment decisions. Behind such behaviors, bubbles and risks loom in the internet finance boom.

2.3 Perceived value (PV)

The theory of customer PV originates from competitive advantage. Akçay, Natarajan, and Xu (2010) believed that an enterprise's competitive advantage should be based on a customer-oriented value chain, and that the customer was the judge of an enterprise product's core value. Since then, PV has been endowed with special connotations and dimensions from various angles, such as the trade-off theory, the element view and the comprehensive value perspective. According to the trade-off view, PV is the comprehensive trade-off between consumers' perceived gains and losses of products or services. Lu and Lin (2012) indicated that the formula "perceived value = perceived benefits/perceived efforts" explained that consumers' PV was not determined by a single factor, but by a trade-off between the benefits and the sacrifice one had to make to obtain that product or service. It was an overall

evaluation of the product or service's utility after the trade-off between its benefits and costs (Zhang *et al.*, 2017). The element analysis perspective defines consumers' PV according to the subdivision of factors. Karjaluoto *et al.* (2019) indicated that the PV of consumers should not only be regarded as a trade-off between quality and price but should also be considered from factors such as function, society, knowledge, emotion, among others. The comprehensive value perspective integrates the abovementioned two views. While considering the consumers' characteristics, various factors, such as the external environment, also define PV (Pea, Jamilena, & Molina, 2017); this is a relatively comprehensive perspective. Summaries of past research on the meaning and dimension of PV indicate that PV is a complex concept that involves subjective perspectives. Existing studies reveal that users' PV affects their choice of network services and that PV provides a foundation for the research of user adoption behaviors.

Based on the analysis of the overall context of PV, this study believes that the PV of consumers, during the investment in internet financial products, not only includes the value generated by the products but also the value brought about by the experience and cognition during the investment process. To further clarify and explore the key factors of user perception in the process, this study applies grounded theory to investigate the meaning of PV, specifically based on internet financial products.

3. Measurement tools of the perceived value of internet financial products

3.1 Qualitative research method

Grounded theory is a qualitative research method that requires in-depth and meticulous research of social phenomena by means of literature research, structured and unstructured interviews, and participatory observations in a natural environment. To collect relevant data in a systematic, scientific and extensive manner, three-staged coding is used to extract and select the core concepts reflecting social phenomena. Then, this study summarizes the theoretical propositions, returns to the data and identifies similar situations for testing. Instead of performing hypothetical deductions in existing theories, the approach used here summarizes and develops new theories based on the data collected during research (Adele & Clarke, 2003). Grounded theory is selected because it is ideal for developing a theory that explains contextually rich processes (Woods, 2002), for which limited theory exists. This study uses the grounded theory method to explore and analyze the measurement of consumers' PV of investing in internet financial products. This study strictly follows the path of "programmed grounded theoretical research" and conducts in-depth interviews with target users of internet finance. Subsequently, users' core categories are systematically analyzed, coded and extracted, and then a measurement table is abstracted for them, based on internet financial products. The objective is to better analyze the appeal of financial users (Adele & Clarke, 2003). The specific analytical process is illustrated in Figure 1.

3.2 Sampling

To better understand consumers' personal feelings in purchasing financial products, 32 experienced users, each of whom had purchased more than three types of internet financial products over the past year or more, and five recent users, each of whom had purchased only one type of such products in the past year or less, were selected as interviewees (their basic information is shown in Table 1). Established users had a relatively more comprehensive understanding and richer experience of internet financial products and were thus taken as the main source of information for this study's grounded analysis. Recent users were slightly inadequate in terms of their understanding of and investment experience with internet financial products, but they also had unique cognitions. The five recent users were used to
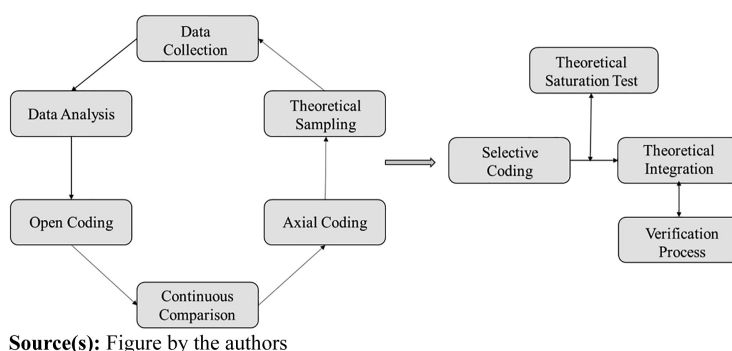
Source(s): Figure by the authors

		Number of people	Percentage (%)
Gender	Male	18	56
	Female	14	44
Age	20–25	11	34
	26–30	9	28
	31–40	8	25
	Over 40	4	13
Educational background	Bachelor's degree	16	50
	Master's degree	11	34
	Doctoral degree	5	16
Profession	Student	19	59
	Teacher	3	10
	Corporate employee	10	31

Source(s): Table by the authors

test the theoretical saturation of the established model. Both unstructured and semi-structured interviews had been adopted, including a focus group interview with the five interviewees. The individual interviews lasted between 30 and 50 minutes, and the focus group interview lasted for 100 minutes. The main content of the interview was how consumers had chosen their ideal financial platforms and internet financial products, as well as their overall feelings during the investment process. Because the interviewees were all interested in and familiar with the relevant topics, the interview went smoothly. Based on their understanding, the interviewees answered relevant questions and addressed the topic quickly, thereby achieving the goal of collecting data. This study classified the interview data. Overall, 25 of the established internet financial user interviewees were randomly selected for the model construction analysis. The interview data of the remaining seven established users and five recent users were used for the theoretical saturation test of the constructed model, to make the overall design more scientific and complete.

3.3 Exploratory research on the perceived value of internet financial products
3.3.1 Open coding. Open coding is a process whereby original interview materials are decomposed, compared and coded to achieve conceptual abstraction and categorization. As the first step in the coding phase, its goal is to build a self-coding table, defined according to specific concepts and mining categories. After obtaining the original data from the in-depth

interviews, QSR-Nvivo 11.0 software was used for qualitative analysis and coding. Three coders participated during the coding stage. Coding was performed after they had reached a consensus on the basic concept of PV and the coding form. The first author of this study carried out the open coding, axial coding and selective coding; the other two coders tested the coding to ensure its reliability. In the first coding, 366 free nodes were obtained. Due to some similar aspects in interviewees' psychological feelings and content irrelevant to the research subject, 310 nodes were retained after topic relevance screening. After classification, merging and conceptual abstraction, 11 categories and 38 concepts were obtained, as shown in Table 2.

3.3.2 Axial coding. To discover and establish various relations between the categories and concepts identified during the open coding process, axial coding was performed for the clustering analysis of those related concepts and categories. When establishing the relations, it was necessary to analyze and compare the conceptual levels of each category according to certain logical relations and combine them without repeating or missing any category. Then, the conceptual connotations surrounding the central, main category were summarized, and the related concepts formed during open coding (listed in Table 2) were obtained after deep

Number	Category	Number of reference nodes	Concept
1	Platform service quality	32	Intelligently recommended products that meet one's needs; timely and considerate customer service; highly transparent and clearly described financial products on the platform; humanized product details
2	Platform service convenience	30	Clear classification of financial products; payment transaction process runs smoothly; diversity of payment methods
3	Platform trade reliability	25	Many users on the wealth management platform; numerous types of financial products; regular payment redemption period; good reputation
4	Sense of economic return on	31	Short redemption time; capital preservation and appreciation; improving the utilization rate of scattered funds; reasonable price
5	Investment pleasurable experience	21	Pleasant investment process; interesting product design
6	Interactive sharing perception	22	Sharing investment experience; reliable financial product recommendations; answering questions; high-quality interaction and sharing of investment experience
7	Risk perception	29	Disclosure of personal identity information; earnings fluctuate greatly and are unstable; lacking legal protection
8	Product reputation perception	28	Good corporate reputation; financial soundness; large scale; no negative news; stable structure
9	Product revenue perception	36	High returns of financial products; strong liquidity; regular dividends
10	Investment identity	25	Meeting personal preferences; getting recommendations from others; recognition; a large number of buyers
11	Sense of cognitive innovation	31	Personalized products; enrichment of personal knowledge; innovation

Table 2.
Results of open coding

Source(s): Table by the authors

abstraction. Finally, the PV of internet financial products was summarized into five dimensions (see Table 3 for details).

3.3.3 Selective coding and theoretical saturation test. Selective coding was used to summarize the core categories, link them with other categories in a "storyline," and examine and analyze their correlations, in order to supplement undeveloped categories. Based on the diversification theory of consumer PV and previous analysis, this study determined the central category of "the dimensional composition of consumer PV of Internet financial products." This paper constructs the theoretical framework of the consumer PV dimension of internet financial products, as shown in Figure 2.

The previously selected data of seven established users and five recent users were coded and analyzed; no new concepts or categories were found in the coding results or the modeling framework. Therefore, the aforementioned theoretical model of consumer PV dimensions of internet financial products can be considered to be saturated, thus precluding the need for further expanding the scope of the data analysis.

3.3.4 Results analysis. The analysis, coding, and theoretical saturation tests were performed on interviewees' data using grounded theory and qualitative research. This study determined that consumer PV of internet financial products contained five dimensions: economic value, attribute value, social value, experiential value and platform functional value. ① Economic value refers to consumers' perception of the economic returns of investment in financial products. For consumers, the primary purpose of investing in internet financial products is to increase the utilization rate of their scattered funds and to maintain or increase the value of those funds. Therefore, low-cost and high-quality financial products are favored and pursued by most consumers. ② The attribute value is the utility that consumers perceive from the internet financial products. It reflects the characteristics of the financial

Number	Axial coding	Influence category
1	Economic value	Sense of economic return
2	Attribute value	Risk perception; perception of product reputation; perception of product returns
3	Social value	Investment identity; perception interactive sharing
4	Experiential value	Pleasant investment experience; sense of cognitive innovation
5	Platform functional value	Quality of platform service; convenience of platform service; reliability of trading on the platform

Source(s): Table by the authors

Table 3.
Results of axial coding
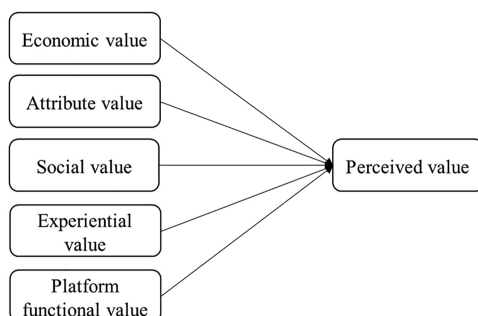
Source(s): Figure by the authors

Figure 2.
Consumer perceived value dimensions of internet financial products

products, including the profitability, risk, brand equity and regular dividends. The attribute value is the basis of a financial product and represents consumers' most direct judgment of the financial products. ③ Social value means that consumers can obtain evaluations from others or social recognition when investing in internet financial products, and meanwhile acquire a certain level of utility from interactions, such as high praise from friends, recommendations from other users and sharing of investment experiences. ④ Consumers experiential value is interactive and relative; it is an experience related to the consumers' preferences. Pea *et al.* (2017) believed that the value of consumer experience could be co-created, not by acting alone, but by interacting with others. Our analysis reveals that consumers' experiential value of internet financial products includes the pleasurable experience and sense of cognitive innovation of the investment process. ⑤ Platform functional value is reflected by the functional utility given to customers in the process of choosing products or services (Shim & Shin, 2016). The platform functional value proposed in this study includes the service quality of the financial management platform, the convenience of platform services and the reliability of platform transactions. Consumers' perception of financial platforms reflects the hardware attributes that users require to use financial platforms.

4. Conceptual framework and hypotheses

Based on the analysis of the measurement tool of users' PV of internet financial products, this study explored users' internet financial BI, which drew on the analytical framework of ternary interaction, wherein individual behavior was influenced by the interaction of the environment, subject and behavior. Additionally, the interaction between the network characteristics of internet financial platforms, the perceptual characteristics of individual users and the BIs of users were investigated. Based on the perspective of user perception, this research systematically and comprehensively analyzed the influential processes of individuals' financial BIs. The research model is illustrated in Figure 3.
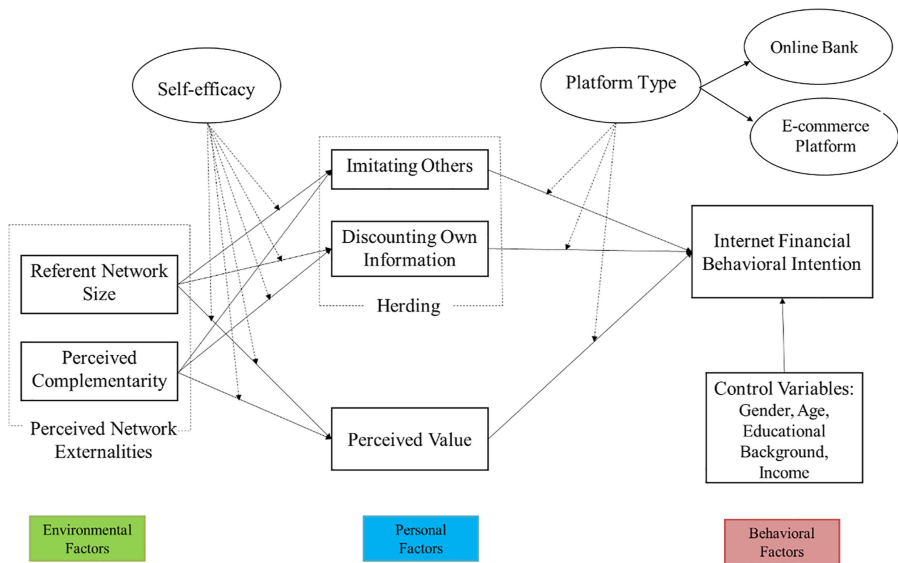

Figure 3.
Internet financial behavioral model

Source(s): Figure by the authors

4.1 Herding and internet financial behavioral intention

Studies have shown that imitation significantly impacts individuals' decision-making (Shanmuganathan, 2020). Investors' preference for high-efficiency and low-risk investments in financial markets creates HE behavior in individuals, and IO is a way to avoid losses. Yen, Wang, and Yang (2017) analyzed the transactional data of the Prosper investment website in the internet financial market, and found that, due to a lack of understanding of project quality, individual investors were more likely to imitate and follow others. Moreover, the public project attribute had a mediating effect on the behavioral judgment of individual investors, indicating that most individual users exhibit rational financial behavior on this investment platform. Since internet financial products still have financial attributes, this rule is also applicable to the adoption of them. The target group of internet financial product providers is college students and white-collar workers who have not accumulated much wealth. They lack investment channels and knowledge, i.e. they are financially unsophisticated, and are likely to be affected by crowd psychology and show a higher tendency toward network products and services that are highly rated by fellow netizens (Shim & Shin, 2016). New users' perception of products will be easily affected by other investors after observing the sales and popularity rankings of products provided by the online financial platform, and they may worry about the possibility of mistakenly rejecting certain types of internet financial products and then suffering losses in yields. In this case, adopters may show an aversion to risk and give greater importance to potential costs/risks than to earnings (Shim & Shin, 2016) and ultimately choose a product that is "good enough." In addition, by definition, DOI means being less sensitive to one's own information and judgment. DOI people exhibit the consumer behavior of purchasing first and believing that pioneers are more knowledgeable. Paying less attention to their information indicates a weaker understanding of and belief in the initial process of financial investment, and their subsequent decision-making behavior will be greatly influenced by external factors and tend to be similar (Chen *et al.*, 2020). By imitating the investment decisions of others and discounting their own information, uncertain users will be more satisfied with following the investment decisions and experiences of the majority. Therefore, the following hypotheses are proposed:

H1. IO has a positive impact on internet financial BI.

H2. DOI has a positive impact on internet financial BI.

4.2 Perceived value and internet financial behavioral intention

In practice, PV is a process of evaluating products and services by comprehensively weighing one's own perceived gains and losses when consuming such products or services. It has an important impact on customers' BIs (Pea *et al.*, 2017; Shim & Shin, 2016; Akçay *et al.*, 2010). In the mobile internet environment, PV significantly affects consumers' intentions to adopt network products and serves as an intermediary variable to explain the impact of other users' characteristics on adoption intention. Consumers comprehensively compare the benefits and costs during online consumption; thus, PV is formed. Increasing perceived benefits and reducing perceived costs positively affect users' online consumption BI (Xia & Hou, 2016). In the internet wealth management process, the value perception of customers is the prerequisite for their participation in internet finance. This study defines users' PV in this context as: (1) users' comprehensive perception of the products and related services provided by a financial platform and (2) consumers' subjective feelings of the interaction and cooperation with other users on the platform. Since online transaction is a virtual process that involves no specific, real items, it is necessary for users to obtain product-related information from other channels. Consumers' PV of the products and services is also established in the virtual environment. Hence, in the investment process, their perception of the relevancy of the

products provided by the platform, the service quality of the platform, the rationalization of the platform design and the network environment may have an important impact on their internet financial behaviors. As the purpose of consumers engaging in internet wealth management is to gain investment experience and profits, high-quality financial products and services, as well as a good interactive investment atmosphere will augment their financial experience and encourage them to actively participate in internet finance. Therefore, the following hypothesis is proposed:

H3. PV has a positive impact on internet financial BI.

4.3 Network externalities and herding

In the traditional financial market, HE explains how investors imitate others' investment behavior and thus aggravate the self-reinforcing quality of market deviations, and leading to abnormal fluctuations in financial markets (Chen *et al.*, 2020). As the study of HE expands to other fields such as IT adoption, online shopping behaviors and public opinion dissemination, scholars find that online user behaviors are prone to exhibiting obvious crowd psychology and HE (Jiang *et al.*, 2018; Zhang & Chen, 2017), and that network externalities and information cascade are the main reasons for HE in the IT industry (Duan, Gu, & Whinston, 2009).

In the internet financial environment, the individual consumer's online behavior is affected by many factors, including the behavior of other users (Zhang & Chen, 2017). Due to information asymmetry, during the consumption process, consumers tend to favor products and services promoted by others, which affects their purchasing decisions. As the consumption of products and services grows, users will have an increased sense of their own utility due to the added value. This, in turn, will increase the opinions and comments they put forward regarding these products and services, i.e. economies of scale from the demand side will emerge (Sun, 2013). In the internet wealth management process, while product information and transactional data are overloaded, the amount of effective information that people can obtain is shrinking, which makes many users suffer from information scarcity when making financial decisions. In this study, network size can be regarded as the number of users on an internet finance platform. When the network scale is large, the platform will contain a large amount of feedback from other users regarding the platform's products or services. This large-scale feedback may reduce the effective information available to users and cause them to lose (or be incapable of identifying) too much information when purchasing financial products (Zhang & Chen, 2017). In this case, they may ignore the information they get and imitate the behavior of other users (Sun, 2013). Therefore, this study proposes that:

H4a. RN size has a positive impact on IO.

H5a. RN size has a positive impact on DOI.

However, with a deeper understanding of online financial platforms' business and financial products, and more frequent and longer exchanges and interactions on the platforms, users will form their own judgments and experiences. Investors analyze, interpret and exchange information through the platforms, so that financial information can be disseminated to other investors. The informational resources generated through online interactions help reduce the market's information asymmetry (Jiang *et al.*, 2018). Increased discussion about a certain company lowers the degree of information asymmetry, which then strengthens the judgmental ability of investors and suppresses HE (Duan *et al.*, 2009). Meanwhile, users who interact on stock exchange forums tend to communicate with or contact people with similar backgrounds or beliefs (Zhang & Chen, 2017). This indicates that the HE of users in the internet wealth management process is affected by informational and user-platform

interaction. A higher degree of network information interaction not only reduces the cost of information searches in an open financial market but also improves the open information environment of the market itself (Bikhchandani *et al.*, 1998). Therefore, for the overall market, the user-platform interaction will weaken the HE of investors. Therefore, the following hypotheses are proposed:

H4b. PC has a negative impact on IO.

H5b. PC has a negative impact on DOI.

4.4 Network externalities and perceived value

As previously discussed, PV reflects an individual's cognition of consumers in the internet wealth management process and users' cognition level of the expected performance and implementation risks of their financial business. In this study, consumers' PV is the trade-off between users' perceived gains and perceived losses from investing in products and services on a financial platform. Most users on mobile social networking platforms usually do not want to make new friends. Instead, they put real-life social networks on the internet to enjoy more frequent contact with people they already know (Karjaluoto *et al.*, 2019). Therefore, when considering the direct network externalities between the interactions of users and internet financial platforms, this study does not focus on the entire social network in which all users are on the same internet financial platform, but pays attention to each individual's referral network, which is composed of people who use the same application in the direct social circle of that user (Chiu *et al.*, 2013; Lin *et al.*, 2011; Zhou & Lu, 2011). The number of peers perceived can be used to evaluate the size of the RN size, reflecting the PV of direct network externalities. When a RN is large, the ever-increasing social interactions and sharing among the network's members will produce a greater sense of usefulness and pleasure (Lu & Lin, 2012). In contrast, when it is small, the users might experience inefficient utility before finally giving up on the mobile social applications.

PC represents indirect network externalities in the process of network interactions (Zhang *et al.*, 2017). When the user base of a product or service expands, users obtain a higher degree of PC, because they gain many complementary functions and services and create additional benefits and more demand. In the applications of mobile network financial platform, supplementary functions (such as social games, photo and video sharing, and friend searches) can help users show themselves and interact with friends, affording them more diversions (Qasim & Abu-Shanab, 2016). Existing studies have confirmed that PC has a positive impact on user's perceived hedonic value. These applications and services increase the usability of the complementary products perceived by users and also further increase the usefulness perceived by users. Therefore, the following hypotheses are proposed:

H6a. RN size has a positive effect on PV.

H6b. PC has a positive effect on PV.

4.5 The moderating effect of self-efficacy

SE is the subjective judgment of one's ability to complete an activity before starting it. In practice, SE can encourage people to go beyond themselves. Bandura (1977) combined organizational behavior and marketing and discovered that a stronger sense of SE would make consumers more pleased and derive a higher perceived benefit during the shopping process. In this study, SE refers to users' judgments about their own knowledge, experience and ability in the internet wealth management process. This is reflected in users' beliefs regarding whether they should reduce their inappropriate investment. The current literature on SE also suggests that, with consumers' understanding of financial products and the

operating mechanisms of the platform deepening, SE can influence or even determine their behavioral decisions, and affect their perceived experience in the behavioral process (Yoris and Kauffman, 2003).

As users accumulate more financial knowledge and investment experience, they become more confident in their financial decisions; that is, their SE is enhanced (Bandura & Albert, 2011). Those with a high level of SE believe that with the knowledge and experience, they can prevent the financial risks caused by irrational investment behaviors. In this situation, the sense of SE plays a promotional role. Users believe they understand the market situation; their self-awareness is enhanced, which helps reduce their HE in the network environment (Yadav & Raman, 2019). In addition, they are able to make more rational evaluations and judgments about the product rankings and content recommendations provided by financial platforms. This, in turn, enables them to make more rational investment decisions. Users with low SE, on the contrary, have no confidence in their ability to distinguish between different types of financial products or to identify the potential risks during the wealth management process. As a result, they will follow the crowd and invest in the most popular products or products recommended by the platforms, and they lack experience and judgment in this process. Even if the platforms provide rich financial services, they may reduce their willingness to invest in financial products after considering the potential risks. Therefore, the following hypotheses are proposed:

H7. SE negatively moderates the relationship between RN size and IO (H7a), and between PC and IO (H7b).

H8. SE negatively moderates the relationship between RN size and DOI (H8a), and between PC and DOI (H8b).

H9. SE negatively moderates the relationship between RN size and PV (H9a), and between PC and PV (H9b).

4.6 The moderating effect of different types of financial platforms
In China, e-commerce platforms and online banking are two typical online environments for internet finance. They are characterized by varying degrees of functional design, product promotion and supervision. Online banking financial platforms are innovative in terms of the sales channels and transaction models, but they do not feature substantive improvement of product attribute settings or business segments (Manser Payne *et al.*, 2021). Shortcomings of their financial products still exist, such as higher purchase thresholds and lower liquidity. At present, China's online banking financial platforms rely on a relatively sound regulatory mechanism to provide users with a safe investment environment with complete information disclosure. The financial products that are launched feature a relatively high degree of information disclosure within a reasonable and comprehensive system. China's e-commerce financial platforms achieve the high traffic volume of financial users through online shopping. Also, based on the frequent interactions in the community environment, various functional services satisfy users' financial and consumption needs (Chen *et al.*, 2021). Users can instantly switch between finances and shopping. However, the financial products provided by e-commerce financial platforms are insufficient in terms of information disclosure and regulatory systems, which can easily breed financial risks. Therefore, this study assumes that, for different types of financial platforms, the impact of various influencing factors on users' internet financial BI differs. That is, the type of financial management platforms plays a moderating role between internet financial BI and influencing factors. The following hypotheses are therefore proposed, and the theoretical model is constructed, as shown in Figure 3:

H10a. Compared with online banking, the imitation of others on e-commerce financial platforms has a more significant impact on internet financial BI.

H10b. Compared with online banking, DOI on e-commerce financial platforms has a more significant impact on internet financial BI.

H10c. Compared with online banking, the PV of e-commerce financial platforms has a more significant impact on internet financial BI.

5. Research methods
5.1 Scale design
Seven constructs are involved in this paper, namely RN size, PC, IO, DOI, PV, SE and BI. The measurement scale of PV in this study was developed by combining grounded analysis and related literature analysis. The scales of the other constructs were adapted from existing scales in previous research, to ensure content validity. Each variable was directly measured using a Likert-type five-level scale, where 5 indicates completely agree and 1 indicates completely disagree. The questionnaire consists of two parts: the first part queried the demographic and behavioral characteristics of respondents, including their gender, age, educational background and user habits with financial products. The second part included measurement items related to the research model. Specific items are shown in Appendix 1.

5.2 Research samples
To draw more realistic and significant conclusions, this study collected data from two types of financial platforms. The sample data of e-commerce application financial platforms collected in this paper come from the wjx.cn (https://www.wjx.cn/), a comprehensive service platform for questionnaire surveys in China. Because we needed to select users from specific financial platforms, the paid sample service was used to ensure the quality of user data. The data collection lasted for one month, and attracted a total of 986 financial users, 631 of whom have purchased e-commerce financial products. Those questionnaires that were returned in less than 300 seconds, with identical answers for all items, or with reverse test results contrary to logic were regarded as invalid and were dropped. A total of 356 valid samples for e-commerce financial platforms were finally obtained, with an effective sample rate of 36.1%. To collect data of online banking financial platforms, we cooperated with three banks in Chongqing and Kunming. The questionnaire was automatically generated by wjx.cn and sent through e-mail, WeChat, QQ etc., to users of the three banks who had previously purchased online banking financial products. A total of 463 questionnaires were collected in six weeks. After excluding the invalid ones characterized by mismatched information or unreasonable response time, 337 valid sample data were finally obtained, with an effective sample rate of 72.8%. The demographic information of the sample is listed in Table 4 below.

6. Results
6.1 Analysis of the research model
6.1.1 Analysis of the measurement model. To ensure the explanatory power of the model of the impact of users' internet financial BI proposed in this study, we performed reliability and validity analysis on the key indices in the research model. The objective was to test the stability and consistency of the measurements of each variable and the validity of the questionnaire items. Reliability, internal consistency and composite reliability were tested. The Cronbach's coefficient and the composite validity of the scale were calculated using statistical software SPSS 21.0; the results for the Cronbach's alpha value and Construct

Variable characteristics	Category	E-commerce financial platform ($N = 356$)	Online banking ($N = 337$)
Gender	Male	159 (44.66%)	155 (45.99%)
	Female	197 (55.34%)	182 (54.01%)
Age	Below 20	12 (3.37%)	3 (0.89%)
	20–29	156 (43.82%)	119 (35.31%)
	30–39	132 (37.08%)	105 (31.16%)
	40–49	37 (10.39%)	63 (18.69%)
	Over 50	19 (5.34%)	47 (13.95%)
Educational background	Senior high or below	36 (10.11%)	41 (12.17%)
	Junior college	72 (20.22%)	58 (17.21%)
	Bachelor's degree	183(51.41%)	215 (63.79)
	Master's degree or above	65 (18.26%)	23 (6.83%)
Monthly disposable income	Less than 2,000	34 (9.55%)	18 (5.34%)
	2,001–3,000	79 (22.19%)	52 (15.43%)
	3,001–5,000	113 (31.74%)	105 (31.16%)
	5,001–7,000	71 (19.94%)	103 (30.56%)
	7,000 above	59 (16.57%)	79 (23.44%)
Number of logins to the application (or website) of the financial platform in the last week	2 or below	36 (10.11%)	51 (15.13%)
	3–4 times	128 (35.95%)	133 (39.47%)
	5–6 times	103 (28.94%)	79 (23.44%)
	7–8 times	56 (15.73%)	55 (16.32%)
	9 or above	33 (9.27%)	19 (5.64%)
Time spent on the application (or website) of the financial platform in the last week	Less than 10 minutes	92 (25.84%)	107 (31.76%)
	10–30 minutes	123 (34.55%)	151 (44.81%)
	30–60 minutes	85 (23.88%)	63 (18.69%)
	1–2 hours	44 (12.36%)	16 (4.75%)
	More than 2 hours	12 (3.37%)	0 (0%)
Number of functions used on the application (or website) of the financial platform in the last week	1–2	57 (16.01%)	118 (35.01%)
	3–4	197 (45.05%)	175 (51.93%)
	5–6	83 (23.31%)	41 (12.17%)
	7–8	14 (3.93%)	3 (0.89%)
	9 or above	5 (1.41%)	0 (0%)

Source(s): Table by the authors

Table 4.
Descriptive statistics of the sample data

Reliability (CR) value for each variable were above 0.7 (see Table 5), indicating that the scale designed in this study is of good reliability (Hair, Sarstedt, Ringle, & Mena, 2012).

Validity reflects the effectiveness of a scale in measuring latent variables in testing measurement models. Confirmatory factor analysis was performed on the research model using Smart PLS 3.0 software. The specific analysis results are shown in Tables 5 and 6. As can be seen, the factor loading of each variable is above 0.7 and the average variance extracted (AVE) value for each factor is greater than 0.5, indicating that the scale has good convergent validity when combined with the CR value (Bagozzi, 1981). At the same time, the numbers on the diagonal in Table 6 reflect the square roots of the AVE values for each factor, which are greater than the correlation coefficients of the corresponding variable. This indicates the good discriminant validity of each variable in the model (Bagozzi, 1981).

6.1.2 Analysis of the structural model. Based on the exploratory theoretical model and the related hypotheses proposed in this paper, the partial least squares structural equation

Variable	Measurement item	Factor loading	Cronbach's α	CR	AVE
RN size	RN1	0.832/0.809	0.823/0.784	0.894/0.874	0.737/0.698
	RN2	0.845/0.855			
	RN3	0.897/0.841			
PC	PC1	0.901/0.866	0.847/0.81	0.906/0.887	0.763/0.724
	PC2	0.841/0.838			
	PC3	0.877/0.847			
IO	IO1	0.757/0.728	0.812/0.804	0.875/0.871	0.637/0.628
	IO2	0.758/0.808			
	IO3	0.864/0.860			
	IO4	0.809/0.769			
Discounting one's own information (DOI)	DOI1	0.888/0.858	0.805/0.721	0.885/0.842	0.72/0.641
	DOI2	0.862/0.826			
	DOI3	0.792/0.711			
PV	PV1	0.783/0.815	0.828/0.813	0.887/0.875	0.662/0.643
	PV2	0.874/0.750			
	PV3	0.74/0.839			
	PV4	0.852/0.758			
SE	SE1	0.909/0.899	0.855/0.84	0.911/0.895	0.774/0.756
	SE2	0.917/0.886			
	SE3	0.81/0.793			
BI	BI1	0.707/0.731	0.713/0.829	0.823/0.886	0.537/0.661
	BI2	0.722/0.796			
	BI3	0.774/0.839			
	BI4	0.728/0.812			

Note(s): The first column of the coefficient value in the table reflects the e-commerce financial platform sample, and the second column reflects the online banking sample
Source(s): Table by the authors

Table 5.
Construct reliability
and validity

	RN	PC	IO	DOI	PV	SE	BI
RN	0.86/0.84						
PC	0.26/0.31	0.87/0.85					
IO	−0.04/0.12	−0.13/−0.03	0.82/0.79				
DOI	−0.06/−0.02	−0.16/−0.14	0.64/0.51	0.85/0.80			
PV	0.42/0.33	0.36/0.30	−0.55/−0.25	−0.60/−0.44	0.81/0.80		
SE	0.24/0.19	0.15/0.09	−0.11/−0.23	−0.19/−0.21	0.24/0.16	0.88/0.85	
BI	0.18/0.22	0.21/0.18	−0.33/0.01	−0.53/−0.27	0.60/0.56	0.14/0.21	0.73/0.81

Note(s): The first column of the coefficient value in the table reflects the e-commerce financial platform sample; the second column reflects the online banking sample, and the diagonal is the square root of the AVE value of each factor
Source(s): Table by the authors

Table 6.
Discriminant validity

modeling (PLS-SEM) method (Hair, Ringle, & Sarstedt, 2013) was used to test the research model. This method was chosen after considering the obvious advantages of partial least squares (PLS) in using small samples to analyze complex models and ensuring the model's predictive ability (Hair *et al.*, 2012).

The structural model was analyzed using Smart PLS 3.0 software. To address any potential inference error in the theoretical model caused by an inability to obtain a large number of research samples, the authors applied the bootstrapping method, using Smart PLS

to perform the repeated sampling analysis. In terms of setting parameters, the number of sub-samples was selected as 3,000; the test type was two-tailed, and the significance level was 0.05. By evaluating and analyzing the path coefficients and determination coefficients of the structural model, the strength of the relationship between the latent variables can be judged, thus verifying the results of the hypotheses. The calculation results are shown in Table 7, and the path coefficient diagram is illustrated in Figure 4.

The calculation results based on the data of the two types of financial platforms in Figure 4 shows that IO exerted a significantly positive impact on internet financial BI (e-commerce platform: $\beta = 0.155$, $p < 0.01$; online banking platform: $\beta = 0.21$, $p < 0.01$). Thus Hypothesis H1 is verified. An interesting finding is that DOI exerted a significantly negative impact on internet financial BI, which contradicts Hypothesis H2; thus, Hypothesis H2 fails. Whether on the e-commerce financial platform or the online banking financial platform, the PV exerted a significantly positive impact on internet financial BI (e-commerce platform: $\beta = 0.488$, $p < 0.001$; online banking platform: $\beta = 0.604$, $p < 0.001$), thus confirming Hypothesis H3. Whether on the e-commerce financial platform or the online banking financial platform, the RN size exerted a significantly positive impact on IO (e-commerce platform: $\beta = 0.134$, $p < 0.01$; online banking platform: $\beta = 0.163$, $p < 0.001$), thus, Hypothesis H4a is supported. The direct path coefficient of PC on DOI was significantly negative (e-commerce platform: $\beta = -0.217$, $p < 0.001$; online banking platform: $\beta = -0.196$, $p < 0.01$), thus verifying Hypothesis H5b. Finally, for both the e-commerce financial platform and the online banking financial platform, network externalities (RN size and PC) exerted a significantly positive impact on the users' PV (e-commerce platform: $\beta = 0.281$, $p < 0.001$; $\beta = 0.411$, $p < 0.001$; online banking platform: $\beta = 0.316$, $p < 0.001$; $\beta = 0.232$, $p < 0.001$), thereby verifying H6a and H6b. According to the results of the structural model analysis, the R^2 values of the four relevant variables were all greater than 0.33 in the structural model analysis in Figure 4, indicating that the structural model proposed in this study has good explanatory power. To test the fit of the model, the standardized root means square residual (SRMR) method was selected for testing, and the results show that the SRMR value is 0.059, which is lower than the standard value of 0.08, indicating that the structural model is a good fit.

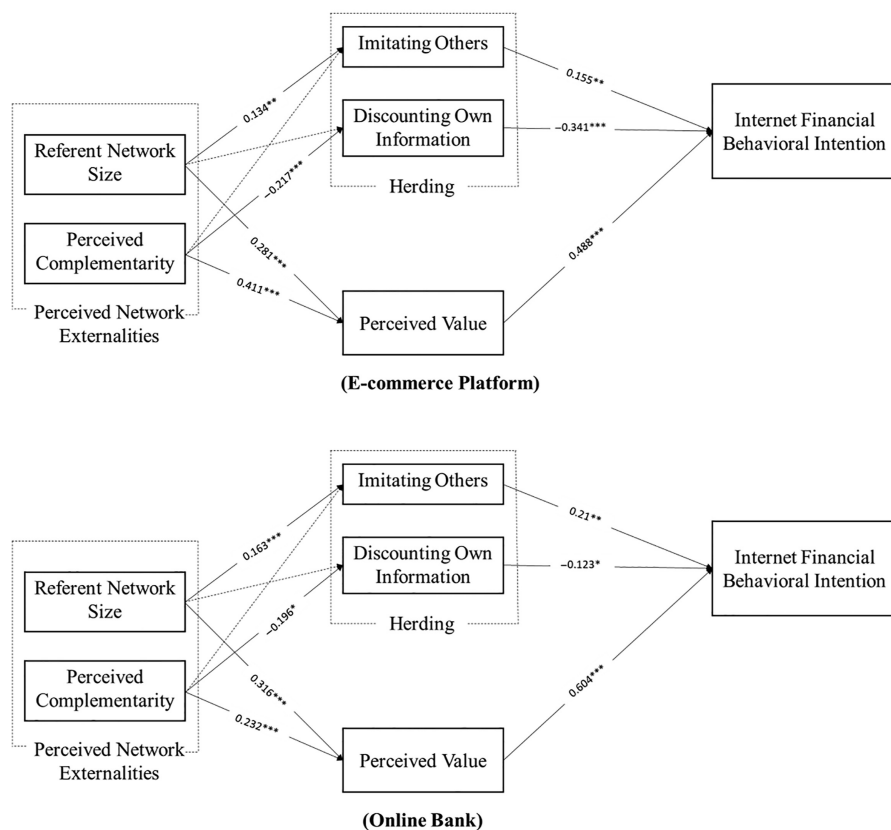*6.2 Testing the mediating effect*
The PLS-SEM method was used in this paper to conduct hypothesis testing. We referred to the research results of Edwards and Lambert (2007) to reduce deviation in the mediating

Hypothesis paths	E-commerce financial platform ($N = 356$)		Online banking financial platform ($N = 337$)	
	β-value	T-value	β-value	T-value
RN size → IO	0.134**	2.221	0.163***	3.256
PC → IO	0.037	0.175	−0.003	0.995
RN size → discounting own information	0.01	0.163	0.044	0.681
PC → discounting own information	−0.217***	3.604	−0.196**	3.122
RN size → PV	0.281***	5.753	0.316***	5.361
PC → PV	0.411***	7.792	0.232***	4.312
IO → Internet financial BI	0.155**	2.676	0.21**	3.231
Discounting own information → Internet financial BI	−0.341***	5.3	−0.123*	2.022
PV → Internet financial BI	0.488***	6.883	0.604***	13.401

Note(s): * represents $p < 0.05$, ** represents $p < 0.01$, and *** represents $p < 0.001$
Source(s): Table by the authors

Table 7.
Smart PLS operation results

(E-commerce Platform)

(Online Bank)

Note(s): * represents $p < 0.05$; ** represents $p < 0.01$; and *** represents $p < 0.001$

Source(s): Figure by the authors

effect testing. A bootstrapping method was used to modify the analysis of the mediating influence of HE and PV on the acting path of users' perception of network externalities on financial BI. The direct effect analysis suggested that the basic conditions for testing the mediating effect were satisfied. The specific results are shown in Table 8.

This section examines the possible mediating effect on the model by calculating the variance accounted for (VAF) of the corresponding paths. VAF < 20% means there is no mediating effect. When 20% < VAF <80%, this indicates that a partial mediating effect exists. VAF >80% indicates that a complete mediating effect exists. As suggested by the test results of the mediating effect in Table 9, "PV" played a completely mediating role in the impact of "perceived network externalities" (RN size and PC) on "financial BI." Meanwhile, "IO" played a partial mediating role in the impact of "RN size" on "financial BI." In addition, "DOI" played a partial mediating role in the impact of "PC" on "financial BI."

6.3 Testing the moderating effect
6.3.1 Test of the moderating effect of self-efficacy. The test of SE's mediating influence in the relationship between network externalities (RN size, PC), HE (IO and DOI), and PV is as

Hypothesis path	E-commerce financial platform ($N = 356$)		Online banking ($N = 337$)	
	β-value	T-value	β-value	T-value
RN size → IO	0.134**	2.221	0.163***	3.256
PC → IOs	0.037	0.175	−0.003	0.995
RN size → discounting own information	0.01	0.163	0.044	0.681
PC → discounting own information	−0.217***	3.604	−0.196**	3.122
RN size → PV	0.281***	5.753	0.316***	5.361
PC → PV	0.411***	7.792	0.232***	4.312
IO → Internet financial BI	0.155**	2.676	0.21**	3.231
Discounting own information → Internet financial BI	−0.341***	5.3	−0.123*	2.022
PV → Internet financial BI	0.488***	6.883	0.604***	13.401

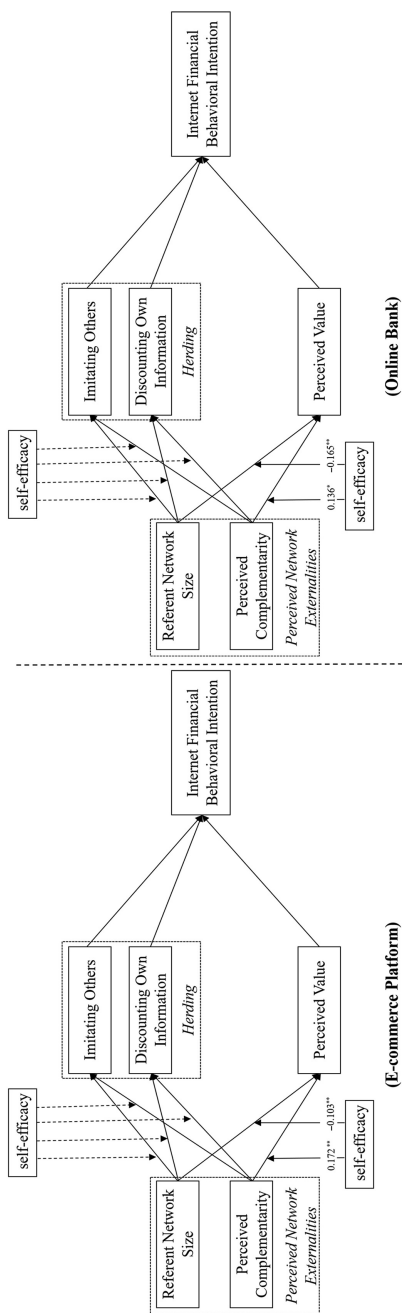**Note(s):** * represents $p < 0.05$; ** represents $p < 0.01$; and *** represents $p < 0.001$
Source(s): Table by the authors

Table 8.
Analysis of the direct effects

Mediating variable	Path	Path coefficient	VAF value	Type of mediating effect
RN size → IO → financial BI	RN size → IO	0.134**/0.163***	38.6%/44.9%	Partial mediating effect
	IO → financial BI	0.155**/0.210***		
	RN size → financial BI	0.033/0.042		
PC → discounting own information → financial BI	PC → discounting own information	−0.217***/−0.157**	61.7%/45.6%	Partial mediating effect
	Discounting own information →financial BI	−0.341***/−0.155**		
	PC → financial BI	0.046/0.029		
RN size → PV → financial BI	RN size → PV	0.281***/0.316***	80.1%/82.0%	Complete mediating effect
	PV →financial BI	0.488***/0.604***		
	RN size →financial BI	0.033/0.042		
PC → PV → financial BI	PC → PV	0.411***/0.232***	81.3%/82.9%	Complete mediating effect
	PV → financial BI	0.488***/0.604***		
	PC → financial BI	0.046/0.029		

Note(s): * represents $p < 0.05$; ** represents $p < 0.01$; and *** represents $p < 0.001$. The first column of the coefficient value in the table reflects the e-commerce financial platform sample, and the second column reflects the online banking financial platform sample
Source(s): Table by the authors

Table 9.
Test results of mediating effect

follows: first, the control variables (i.e. gender, age, educational background, and income) and independent variables (i.e. RN size and PC) were added. Second, the role of SE on the HE (i.e. IO and DOI) and PV was added. The test results showed that SE had no significant impact on either the HE (i.e. IO and DOI) or PV. Third, the mediating effect of SE was tested. The variable of SE interacted with the independent variable of the two types of latent variables to form two interaction terms. These were added to the PLS-SEM model to detect the path coefficients of the interaction items on PV and HE (i.e. IO and DOI). The significant correlation is illustrated in Figure 5, and the test results for each hypothesis are listed in Table 9.

Note(s): * represents $p < 0.05$; ** represents $p < 0.01$, and *** represents $p < 0.001$
Source(s): Figure by the authors

Figure 5.
Test of the moderating
effect of self-efficacy

The test results showed that, whether on the e-commerce financial platform or the online banking financial platform, SE exerted a significantly negative mediating effect on the impact of RN size on PV (e-commerce platform: $\beta = -0.103$, $p < 0.01$; online banking financial platform: $\beta = -0.165$, $p < 0.01$), thus verifying Hypothesis H9a. SE exerted a significantly positive mediating effect on the impact of PC on PV (e-commerce platform: $\beta = 0.172$, $p < 0.01$; online banking financial platform: $\beta = 0.136$, $p < 0.05$), thus verifying Hypothesis H9b. Therefore, according to the results shown in Table 10, Hypotheses H7a, H7b, H8a and H8b were not verified.

6.3.2 Test of the moderating effect of platform types. To test the moderating effect of different types of financial platforms on the research model, according to Hair, Risher, Sarstedt, and Ringle (2019), this study used the PLS multi-group analysis (MGA) approach to analyze the sample data of the two types of platforms, namely the e-commerce and online banking financial platforms. As shown in Table 11, DOI is a significant factor of internet financial BI for users of both platforms; the effect on the e-commerce financial platform is stronger ($\beta_{\text{e-commerce}} = -0.341$, p-value $= 0.000$; $\beta_{\text{online banking}} = -0.123$, p-value $= 0.031$; MGA p-value $= 0.001$), thus verifying H10b. However, different financial platforms show no significant difference in the strength of the effect of IO and PV on internet financial BI. Therefore, H10a and H10c are not supported.

Variables and relevant paths	E-commerce financial platform ($N = 356$)			Online banking financial platform ($N = 337$)		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
Control variable						
Gender	0.095	0.095	0.093	0.033	0.033	0.032
Age	0.068	0.069	0.069	−0.012	−0.010	−0.010
Educational background	0.040	0.040	0.040	−0.031	−0.030	−0.030
Income	0.026	0.028	0.028	0.024	0.026	0.026
IO						
RN→IO	0.134**	0.130**	0.137**	0.163***	0.166***	0.165***
PC→IO	0.037	0.036	0.032	−0.003	−0.012	0.047
SE→IO		−0.072	−0.105		−0.094	−0.116
SE*RN→IO			0.036			0.175
SE*PC→IO			0.039			0.069
Discounting own information (DOI)						
RN→DOI	0.01	0.017	0.013	0.044	0.051	0.053
PC→DOI	−0.217***	−0.214***	−0.221***	−0.196***	−0.199***	−0.198***
SE→DOI		−0.098	−0.103		−0.085	−0.079
SE*RN→DOI			0.079			0.111
SE*PC→DOI			0.046			0.012
PV						
RN→PV	0.281***	0.276***	0.255***	0.316***	0.312***	0.293***
PC→PV	0.411**	0.403***	0.414***	0.232***	0.233***	0.241***
SE→PV		0.102	0.075		0.092	0.087
SE*RN→PV			−0.103**			−0.165**
SE*PC→PV			0.172**			0.136*
R^2(%)	0.491	0.503	0.534	0.472	0.493	0.509
$\triangle R^2$		0.012	0.043		0.021	0.037

Note(s): * represents $p < 0.05$; ** represents $p < 0.01$; and *** represents $p < 0.001$
Source(s): Table by the authors

7. Discussion and contributions

7.1 Discussion

To explore the impact of financial users and the network environment of financial platforms on individual financial BI, this study first analyzes the specific connotations of individuals' PV of internet financial products, based on grounded theory. Subsequently, on the basis of network externalities and the HE, a theoretical framework is constructed to analyze the effects of the various dimensions of network externalities on HE, PV and financial BI. In addition, the differences in the influencing mechanism are revealed through individual characteristics and platform types. The research results demonstrate the following:

(1) Users' PV of internet financial products can be divided into five distinct dimensions: economic value, attribute value, social value, experiential value and platform functional value. This conclusion is derived from the information extraction process of consumers' own information (Shim & Shin, 2016). This finding can provide a reference for financial platforms and internet finance enterprises on how to achieve consumer orientation and realize accurate and effective marketing and expansion.

(2) In the internet wealth management process, PV is the most important factor affecting consumers' financial BIs. Whether on the sampled e-commerce financial platform or the online banking financial platform, users' PV had a highly significant positive correlation with such intention (Yung-Shen, Feng-Shang, & Wu, 2016). This finding shows that products and services on internet financial platforms have functional attributes, and improving consumers' perceptions and experiences is key to enhancing consumer loyalty.

(3) The phenomenon of HE plays an important role in internet financial consumption behavior. The impact (positive or negative) of HE on internet financial BIs depends on the influential intensity in two dimensions. Users make the same investment decisions as most people do after observing others' purchase behaviors, which indicates that they make financial decisions through behavioral observation of the financial platform's consumption, and that they are subject to the impact of external motivation: IO. The generation of HE also relies on an internalization process. That is, users will reduce the sensitivity to their own information and judgment, and make financial decisions after observing other users' decisions and the information released by the platform (Kim & Petrick, 2021). This process is completed through internal motivation. Specifically, whether on the sampled e-commerce financial platform or the online banking financial platform, IO positively affected users' internet financial BI. This finding is consistent with the research conclusions of Sun (2013). The unexpected result is that, on both platforms, DOI negatively affected users' internet financial BI; this contradicts Hypothesis H2. This finding shows that, in the internet

	Path coefficients			
Paths	E-commerce financial platform	Online banking	Path coefficient difference	p-values
IO →Internet financial BI	0.155**	0.210**	−0.055	0.830
Discounting own information → Internet financial BI	−0.341***	−0.123*	−0.218***	0.000
PV → Internet financial BI	0.488***	0.604***	−0.116	0.075

Note(s): * represents $p < 0.05$; ** represents $p < 0.01$; and *** represents $p < 0.001$
Source(s): Table by the authors

Table 11.
Muti-group analysis of the e-commerce financial platform sample ($n = 356$) and the online banking sample ($n = 337$)

wealth management process, users do improve their cognitive ability after receiving information and knowledge from multiple sources in social network interactions. They will think more carefully about investment decisions regarding financial products and strive to achieve rational wealth management. This finding proves that the interaction between a financial platform and its users can promote rational investment on the part of the users. This will help alleviate the problem of "irrational investment" in China's capital markets.

(4) In the internet financial consumption scenario, the impact of the financial platforms' network environment on HE was achieved through two dimensions of network externalities: RN size and PC. Of the two, RN size exerted a significantly positive impact on the IO, while the PC exerted a significantly negative impact on the DOI. The interaction between users and financial platforms will inhibit the HE generated by users' blind following and irrational investment, so that users will make more rational and informed investment decisions.

(5) In China's internet financial environment, the effect of network externalities on PV is as follows: RN size and PC both significantly positively affect the PV of users. That is, in this study, when the user base of a product or service expanded, supplementary functions (such as social and financial applications of the mobile internet financial platform) helped users present themselves and interact with other users. In this way, they could perceive the actual usability of the supplementary products and financial services, which ultimately enhanced their SE and PV. For users with a high level of SE, the complementary products and business functions provided by the financial platform were more useful than for those with a low level of SE; the former also showed more rational judgment when faced with miscellaneous online financial information, and were better able to judge the financial information quality to such a degree that blind following and shortsighted behavior were less likely to occur.

(6) E-commerce financial platforms showed stronger network interaction than online banking financial platforms. The sampled financial platform achieved interaction and sharing among customers through the social network, which in turn improved users' SE and self-cognition. The online banking financial platform had advantages in terms of risk control and marketing channels. The impact of platform differentiation on users' financial behavior was reflected as follows: (1) the impact of HE: IO was more significant on users' internet financial BI on online banking financial platforms. (2) The impact of the HE—DOI was more significant on users' internet financial BIs on e-commerce financial platforms. (3) The impact of PV on users' internet financial BI was more significant on online banking financial platforms.

(7) The mechanism of the network environment of financial platforms on users' internet financial BI was realized through two important paths: (i) network externalities → the HE (DOI and IO) → users' financial BI, and (ii) network externalities → PV → users' financial BI. These two paths effectively describe the changes in individual users' perception under the impact of the financial social environment, and the differences in their financial BI in the internet wealth management process through the characteristic variables of individual users: SE and platform type.

7.2 Theoretical implications
First, this study constructs and verifies the influence transmission mechanisms of users in the investment process in internet finance, which is subject to the impact of individuals and

the environment. An exploratory analysis is conducted from the dual perspectives of financial platforms and financial users. Also, based on grounded theory, this study explores the specific dimensions and internal mechanisms of the PV of financial users in the investment process. More importantly, the integration model constructed in this study clearly explains the role, status and causality of network externalities, HE and PV in users' financial BI. The influencing process of the platform network environment on individual users is also revealed. For the first time, the antecedents that influence users' internet financial BIs are comprehensively investigated from the aspects of environmental characteristics, individual characteristics and user psychology.

Second, using grounded theory, in-depth interviews are conducted on the target subject, internet financial users. The interview results are analyzed to construct the specific dimensions of consumers' PV of internet financial products, including economic value, attribute value, social value, experiential value and platform functional value. This has a certain complementary and innovative effect on the application of PV in internet finance, which can help advance the theory of PV.

Third, individual characteristics are introduced into the influence mechanisms of the network environment of financial platforms on users' financial BI. The aim is to observe the differences in the impact of different financial groups on social networks. This research classifies the financial user groups based on their levels of SE. Through empirical testing, the impact of the network environment on the PV of individuals is found to be related to the individuals' characteristics. Financial users with a high level of SE are more cautious in identifying network information on the platforms and make more rational investment decisions. The impact of the network environment on this type of users is more obvious.

Finally, this study clarifies that the mechanism of the network environment of financial platforms on users' internet financial BI is realized through two central paths (i) network externalities → the HE (i.e. DOI and IO): → users' financial BI, and (ii) network externalities → PV → users' financial BI. These two paths effectively describe the perception changes in individual users under the impact of the financial social environment. They also describe the differences in financial BIs in the internet wealth management process through the two characteristic variables of individual users, namely SE and platform type. At the same time, this study distinguishes the varying effects of network externalities between e-commerce financial platforms and online banking financial platforms.

7.3 Practical implications

The conclusions of this paper have the following implications for internet financial regulatory agencies, financial platforms and users. First, for regulatory agencies, it is imperative to regulate the operating order of internet financial platforms, to improve platforms' security ratings and to achieve market benchmarking of product layout and service quality. Users highly value the security regarding a platform's products and services when investing in internet financial products. Therefore, standardizing the functional construction of internet financial platforms, improving the transactional security level of platforms and the scientific nature of products and the convenience of services, and satisfying user demands are all key to promoting the healthy and orderly development of the internet financial industry. In the meantime, regulatory agencies should strengthen information disclosure of internet financial products, including principles, management and responsibilities. This will help reduce the financial risks caused by large-scale irrational financial behaviors.

Second, for internet financial platforms, basic services should be improved, and content should be optimized to increase user loyalty. In terms of basic business, they should focus on the functional design, simplify the transaction process, improve the aesthetics, practicality and fluency of the platforms, strengthen users' interactions and information sharing, and

enhance the charm of the platforms. At the same time, according to users' retained information and search habits, big data technology can be used to accurately analyze relevant products, enhance product layouts, and attract financial users through streamlined and efficient product displays and effective information disclosure. In terms of content optimization, financial platforms should consider researching, developing and implementing emerging technologies. Based on information technologies such as big data and artificial intelligence, user portrait analysis and similar population expansions can be performed while ensuring the regular and safe operation of the platform.

Finally, for internet financial users, improving personal financial literacy and risk awareness is necessary. They should have a relatively complete reserve of financial knowledge about the internet wealth management process, actively follow the latest news, increase their information sensitivity and distinguish the quality of network information. Arming themselves this way will help to avoid the bellwether effect, reduce irrational investment behaviors and form a healthy and safe financial environment.

7.4 Research limitations and future work
Some deficiencies in this paper are worthy of further discussion in future studies. The first is the limitation of the research sample. Although strict standards were followed in the sample selection and data collection in the qualitative research, due to the inevitable difficulty in data acquisition and information authenticity, there is a lack of necessary comparative cases, and the total number of research objects is small. Therefore, the data are relatively thin. In the empirical analysis, this study selected internet financial users on two typical financial platforms as respondents. However, due to different platform backgrounds and user characteristics thereof, the BIs of users may also be different. Therefore, it is suggested that more types of platforms should be included in subsequent studies, in order to verify the external validity of the research conclusions.

The second limitation is caused by the wide range of influencing factors, which is very difficult to measure. Based on the dual perspectives of the platform and users, this research constructed an influence model of internet financial behavior. The action paths of each influencing factor were also systematically analyzed. However, the factors that affect users' behavioral decisions are, by no means, limited to the specific variables selected in this study.

Finally, the research method selected by this study was the questionnaire, supplemented by the application of grounded research. Subjective thinking still exists in terms of object selection, questionnaire design, and inquiry. More research methods (such as case studies and experimental research) should be used in future studies to cross-check the research results. Moreover, there are different characteristics in the behavior of internet financial users during different periods. Therefore, longitudinal studies can be used in the future to grasp the dynamic evolution law of the behavior of financial users.

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Appendix 1

Constructs		Measurement item	Source
RN size	RN1	As far as I know, many people buy internet financial products on this platform	Lin and Bhattacherjee (2008)
	RN2	Many of my friends and family members buy internet financial products on this platform	
	RN3	I expect that many people will buy internet financial products on this platform	
PC	PC1	This financial platform provides more than one type of internet financial product for customers	Zhou and Lu (2011)
	PC2	This financial platform has a wide range of support tools (such as picture sharing, information sharing and video sharing)	
	PC3	This financial platform provides a wide range of life services (such as payment for living expenses, online shopping, and credit card repayments)	
Imitating others (IO)	IO1	In my opinion, this financial product is the featured product of this platform, and thus, I want to buy it, too	Sun (2013)
	IO2	I will follow others to buy internet financial products on this platform	
	IO3	I will buy internet financial products on this platform because a lot of people have already done this	
	IO4	I will buy popular products promoted by the media	
Discounting own information (DOI)	DOI1	My purchase of this financial product does not reflect my preference for this product	Sun (2013)
	DOI2	I do not make the investment decisions based on my own research and information	
	DOI3	If I do not know many people have bought this financial product, I might choose another type of financial product	
PV	PV1	Financial products on this platform can help me to obtain higher returns	Yung-Shen *et al.* (2016)
	PV2	Internet finance on this platform can bring convenience to my daily life	
	PV3	Financial products on this platform can make me feel secure	
	PV4	Financial products on this platform can bring me psychological satisfaction	
SE	SE1	I have confidence that I can make effective investments on this internet finance platform	Bandura and Albert (2011)
	SE2	I have confidence that I can proficiently use relevant financial software to purchase financial products	
	SE3	I have relevant knowledge and the ability to invest in internet financial products	
BI	BI1	I will participate in internet finance on this platform and buy required products	Bhattacherjee (2001)
	BI2	I will recommend my friends to buy financial products on this platform	
	BI3	If needed, I would like to increase the frequency and amount of investment on this platform	
	BI4	I will use the service provided by this platform in the future	

Source(s): Appendix by the authors