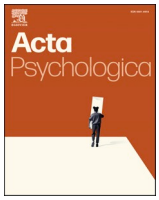
Acta Psychologica 260 (2025) 105465

Contents lists available at ScienceDirect

Acta Psychologica

journal homepage: www.elsevier.com/locate/actpsy



Central bank digital money (CBDM) uses among patrons in hospitality and tourism

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ARTICLE INFO

Keywords:
Central bank digital money (CBDM)
Digital currency
Innovation
The theory of planned behavior
Transaction

ABSTRACT

An industrial trend regarding a surging amount of attention to central bank digital money (CBDM) by government bodies and consumers has recently been observed. The aim of this study is to assess the roles of the antecedents and moderators, which include fear of missing out, confidence of CBDM in the digitalized era, and attachment to CBDM, in regards to predicting CBDM adoption within the framework of the theory of planned behavior and the five phases of the consumer adoption process in order to keep up to date with this rapidly changing industrial trend. Data sets from 515 respondents were collected for empirical analyses via an online panel survey in order to achieve the research objectives. The results revealed that the relationships between the five stages and CBDM adoption were significant. The moderating effects of confidence in CBDM within the age of digitalization and attachment to CBDM were also observed. This study is an initial attempt to assess the reactions of consumers to CBDM adoption and helps explain the psychological structures of consumers that are related to adopting new technology and diverse decision making.

1. Introduction

CBDM is progressing as an alternative digital currency, which provides customers with the advantages of an easy, secure, and cost-effective payment system (Nuryyev et al., 2020). CBDM is a digital legal tender that is issued and regulated by the central banks of sovereign countries (Auer et al., 2022; Kaur et al., 2024). 134 nations and currency unions, which comprise of 98 % of the global GDP, are currently at various stages of CBDM development (Atlantic Council, 2025). The South Korean central bank, which is in partnership with seven domestic banks and local retail businesses, has initiated a pilot program for using CBDC for payments. The pilot project is planned to serve about 100,000 customers by converting their bank money to CBDM tokens and using them for payments, which offers a 10 % cashback as a promotional incentive (Grant, 2025). Little is known about the adoption of CBDM by travelers for payments despite the potential benefits of CBDM for the tourism and travel industry (Lee et al., 2025). On the other hand, the successful implementation of innovations, such as CBDM depends on accurately predicting the attitudes and motivations of various consumer groups toward the technology (Bijlsma et al., 2021). Moreover, the incorrect predictions of customer adoption behavior could lead to widespread rejection by the general public, specific sectors, or user groups (Kim et al., 2022).

The previous studies explored the preferences of travelers for various digital payment modalities, which include mobile banking and cryptocurrencies (Mareh et al., 2025; Moon et al., 2025; Quan et al., 2024; Radic, Quan, Koo, et al., 2022). The innovative characteristics, risk, and functionality of technologies (Han et al., 2024; Kim et al., 2024; Lee

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https://doi.org/10.1016/j.actpsy.2025.105465
Received 21 March 2025; Received in revised form 16 August 2025; Accepted 21 August 2025
Available online 5 September 2025

et al., 2025; Radic, Quan, Koo, et al., 2022) were explored in the CBDM realm in order to explain the adoption decisions of travelers in regards to CBDM. For instance, Lee et al. (2025) studied the adoption of CBDM among international Chinese travelers using the extended TAM framework, and they found that the technologies on-site use capability, perceived usefulness, economic benefits, and source credibility as significant factors for the CBDM adoption decision of travelers. Chua et al. (2025) explored how the dispositional and institutional trust of customers determine their trusting beliefs and adoption decisions of CBDC payments for traveler-related payments and settlements. Kim et al. (2024) investigated the perceived risk factors of financial, performance, privacy, psychological, and time risks as key factors for the CBDM adoption decision of travelers. Han et al. (2024) also explored the drivers and barriers of the adoption of CBDM in the Korean travel industry.

The research on CBDC application and adaptation in the travel and tourism industry remains scarce despite recent attempts. A review of the limited research on CBDM showcased major research gaps. First, a bunch of studies on CBDM deal with financial stability and feasibility issues that are bound with macro-level investigations (Bas et al., 2024; Infante et al., 2024; Luu et al., 2023; Ozili, 2023), which leave individual-level adoptions understanded. Continued research efforts at the micro-level in order to understand the intentions and actual adoption decisions of users would therefore be instrumental for rapid and large-scale adoption of the technology over wider economies and sectors. Second, the idea and practice of CBDM as a payment system is new for the tourism industry. The overall public awareness and confidence are expected to be minimal due to the fact that only three developing countries, which include the Bahamas, Jamaica, and Nigeria, have fully implemented the technology (Atlantic Council, 2025). The South Korean Central Bank even announced the pilot of the Korean CBDM in early April 2025 (Grant, 2025). This warrants the need to explore more of the individual's adoption behaviors as a new payment system for travel-related transactions.

Third, the underlying attitudinal and psychological mechanisms that drive adoption under the adoption process have not yet been clearly indicated despite studies that attempted to explore the adoption of CBDM by customers under different contexts. The study by Kim et al. (2022) investigated customers adoption by focusing on the CBDM technological characteristics and customers hierarchical adoption process, which relied on the innovation diffusion model (Rogers et al., 2014), but their study lacks clarity regarding how the evaluation of the technology by these types of users affects their attitudes, behaviors, and psychological states in order to facilitate or hinder adoption decisions. Nam et al. (2022) argued that the future adoption of blockchain-based CBDM might be a technological issue as well as also a behavioral concern that heavily depends on the attitudes and intentions of individuals. Thus, the customers attitudes and intentions could have significant implications on their intentions and adoption of CBDM payment systems beyond their evaluation of technological characteristics. Thus, an integrative approach in regards to studying the adoption decisions of travelers in regards to CBDM will be imperative.

Last, the earlier studies explored cultural, product, and personal factors in order to moderate the relationship between the attitude and adoption intention of individuals toward CBDM payments (Kim et al., 2022; Kim et al., 2024). The role of the emotional and psychological state of customers in regards to moderating these types of relationships was rarely examined despite this. Thus, the current study used fear-of-missing-out (FOMO) as well as the attachment of customers to CBDM and confidence about increased CBDM use in the digital in order to moderate the structural relationship between attitude, subjective norms, and behavioral control, trail, and the adoption decisions of travelers.

This study relied on the integrative conceptualization and analysis of the adoption of CBDM payment systems of travelers using the five-stage innovation adoption process by Rogers et al. (2014) and the TPB (Ajzen, 1991) in regards to the research gaps that are mentioned above. The current study specifically intended to achieve four major objectives that include 1) examining the relationship between the five-stage CBDM adoption process in patrons, which include awareness, interest, evaluation, trial, and adoption intention, 2) analyzing the association between awareness and attitude, subjective norms, and perceived behavioral control, 3) exploring how attitude, subjective norms, and perceived behavioral control influence the intention of patrons to adopt CBDM, and 4) evaluating the moderating role of FOMO, confidence about CBDM in the digital age, and attachment to CBDM in regards to the relationship trial and TPB variables and the adoption intention of travelers.

This study contributes to both theory and practice by doing these things. First, this study contributes to the growing body of literature regarding the adoption of travelers in regards to the CBDM in the tourism and travel context. Second, this study extended the TPB by integrating the five stages of the CBDM adoption process by providing an extended conceptualization and analysis of the CBDM adoption of travelers in response to the recent calls for the development of extended theoretical frameworks in order to capture the complex nature of customer innovation adoption (Sahi et al., 2021). Thirdly, the study goes beyond the impact of technological characteristics and extends the previous studies in the tourism literature (Kim et al., 2022; Kim et al., 2024; Lee et al., 2025; Radic, Quan, Ariza-Montes, et al., 2022; Radic, Quan, Koo, et al., 2022), which broadens the understanding of consumer attitudinal and psychological mechanisms in order to explain the DBDM adoption of customers.

2. Literature review and hypotheses

2.1. Central bank digital money in hospitality and tourism

The payment system has experienced a significant transformation over the years, and new payment methods and interfaces have merged in the market (Chauhan & Sharma, 2024). The demand for cash has currently sharply declined, but digital payments are on the rise (Prasetyo et al., 2025). Approximately one-third of youths worldwide now pay and receive money digitally (WB, 2022). The global supply of digital money is also increasing, which is proven by the fact that about 90 % of the money supply exists in electronic form on computers (Radic, Quan, Ariza-Montes, et al., 2022).

The advent of blockchain technology further transformed the nature of money from physical to digitally issued currencies (Jimenez et al., 2024; Önder & Gunter, 2022), which allow users to get access to efficient and convenient payment systems for national and cross-border payments (Auer et al., 2020). Governments and the public have shown a lot of interest in CBDM as an alternative digital currency and payment system. Its popularity is related to the global concerns that are related to traditional bank notes, credit cards, and even privately issued decentralized cryptocurrencies and stablecoins (Engert & Fung, 2017; Lee et al., 2021). CBDM refers to digital currencies that are backed by central banks, such as the regular physical currencies that are used in our day-to-day activities (Auer et al., 2022). It is a digital version of a sovereign currency of a country, which is authorized and overseen by central banks (Kiff et al., 2020). CBDM is similar to paper currencies, and it designed to serve as a unit of measurement, a store of value, and a payment tool for local and cross-border transactions (Lee et al., 2021).

The adoption and use of CBDM is expected to progress in the hospitality and tourism industry in light of the growth of e-commerce for tourism products and services and the need for efficient cross-border payments by tourists (Wang & Chan, 2025). Moreover, CBDM is believed to offer several advantages to the hospitality and tourism sector that include strengthening market competitiveness, reducing transaction costs that are related to paper money, facilitating integrated and secure overseas transactions, and creating convenience and accessibility, which will thereby increase international travel and tourism. CBDM can provide tourists and tourism operators with a seamless

payment system, improved traceability, and real-time payment capabilities at the micro-level (Lee et al., 2025).

A lot of the research on CBDM has mainly focused on design issues and macroeconomic and public policy implications (Bindseil, 2019). Náñez Alonso et al. (2021) discussed the motivation for CBDC research and adoption across sovereign economies in order to encompass increased access to financial services, security, consumer protection reasons, and monetary policy as the main drivers of adoption across countries. However, motivations for adopting a CBDC system among individuals might be different. CBDM claims to have tangible benefits for all stakeholders of the tourism and travel industry, but the amount of user-focused CBDM studies are still limited (Kaur et al., 2024). A flawed prediction about the adoption behavior of users will also lead to the failure of the innovation (Kim et al., 2022). Analyzing the assessment and adoption decisions of individuals is key to the scalability of the technology across customers, businesses, and society, which is in agreement with the macro and meso-level assessment of CBDM.

2.2. Five-stage consumer adoption process

The complexity of the decision-making behavior of consumers leads to various perspectives and conceptualizations regarding their innovation adoption. These perspectives range from the traditional economic view of *rational consumer*, which is where customers make decisions based on rational evaluations of the benefits and costs of alternatives to the cognitive and emotional view of decision-making (Radder, 2003; Zaichkowsky, 1991). Some studies indicate that the cognitive and emotional mechanisms that underlie the choices of consumers concerning innovation provide a more realistic understanding (Roberts-Lombard, & Petzer, 2021). One approach that illustrates this is the staged approach to the diffusion of the innovation theory (DIT), which was proposed by Rogers et al. (2014). This theory highlights three major factors influencing innovation adoption, which include the characteristics of the customers, innovation characteristics, and the process of innovation adoption.

The adoption of innovation is conceived to be a broader concept that encompasses more than a one-time use of the innovation, which relies on the third component (Ozanne & Churchill Jr, 1971). It instead depends on several stage-based evaluations of benefits and challenges that are associated with the technology (Antil, 1988). Individuals often evaluate the technology's advantages and disadvantages through a step-by-step process when they make technology adoption decisions, so their adoption decision can therefore be seen from the staged-process perspective (Rogers et al., 2014). Salim et al. (2014) argued that the technology adoption and continuous use decision of individuals follows a step-by-step process, which ranges from information search and appraisal to trial and confirmation, and it involves the cognitive and emotional appraisal processes of consumers. Adoption mainly deals with the subsequent purchase or continuous use of innovations of users (Antil, 1988). It involves making decisions in a multiple-stage process that involve awareness, interest, evaluation, trial, and adoption (Frambach & Schillewaert, 2002; Zenobia & Weber, 2013). Furthermore, the factors that influence how people embrace new technologies change as adopters move from one stage to the next (Salim et al., 2014).

This approach is important in order to comprehensively analyze the adoption behavior of tourists, because they intend to evaluate features of the CBDM technologies through a cognitive and affective process, which include risks, benefits, innovation characteristics, and the technology's congruence to their travel needs and demands (Kim et al., 2022; Lee et al., 2025). The process regarding how an innovative digital payment system, such as CBDM is accepted by a group of potential customers, such as international tourists can therefore best be explained by the innovation diffusion model by Rogers et al. (2014) under the five-stage CBDM adoption process. The five-stage adoption approach is beneficial, because it is vital in regards to explaining the changing attitudes of travelers toward CBDM payments over time (Breitenbach & Van Doren, 1998).

2.3. The theory of planned behavior (TPB)

The TPB, which was proposed by Ajzen in 1991, is a well-established model in regards to examining the factors that shape the intentions of individuals to engage in a certain behavior. The immediate antecedent of a behavior in the TPB model is the individual's intention to perform the behavior (Ajzen & Schmidt, 2020). Behavioral intentions are contingent upon three important factors as a result, which include attitude toward the behavior, subjective norms, and perceived behavioral control (Yoo et al., 2020). Attitude represents an individual's overall evaluation and perception of engaging in a specific behavior (Ansari, 2022). Subjective norms in contrast represent perceived social pressure in regards to the acceptance or rejection of a behavior (Conner, 2020). The third factor, which is perceived behavioral control, relates to the beliefs of individuals about how easy or difficult it is to conduct the behavior (Xinlin et al., 2024). It is also related to the availability of resources and facilitating conditions, which include rules, regulations, and policies, in order to support or impede innovation adoption (Ajzen & Schmidt, 2020).

Nam et al. (2022) argued that the future adoption of blockchain-based CBDM might be a technological issue as well as also a behavioral concern that heavily depends on attitudes and intentions. The customers attitudes and intentions could have significant implications for their intentions and adoption of CBDM payment systems beyond their evaluation of technological characteristics as a result. The TPB is therefore highly relevant in regards to understanding the decisions of travelers regarding CBDM adoption.

The attitude of travelers toward CBDM is influenced by the perceived benefits and the added value that it offers (Kim et al., 2022). A positive attitude toward CBDC compared to other digital currencies and payment systems can enhance trust among users. This trust is partly derived from the beliefs of travelers about the reliability of intermediaries that are involved with digital currencies (Bindseil, 2019). According to Zarifis and Cheng (2023), the lack of popularity of privately issued digital currencies, such as Bitcoin is attributed to their volatility and security risks. This has fostered a more favorable attitude and behavioral intentions toward government-issued and controlled digital money, which ultimately increases its adoption rate. Ongoing developments in digital technology in addition to the commitment of governments and central banks to establish CBDM can also further positively impact the attitudes of tourists (Radic, Quan, Ariza-Montes, et al., 2022). CBDM, which is supported by blockchain technology, is generally conceived as the future of payment technology, which is capable of providing efficient, cleaner, and minimum-risk payments and services to individuals and businesses (Liu et al., 2023). Public opinion and attitude are expected to grow positively over time to the extent that non-adopters are influenced by their peers. The TPB could serve as a theoretical framework in regards to studying the CBDM adoption decisions of travelers for tourism and travel services.

2.4. Relationships between the CBDM adoption process stages

The process of adopting innovations involves multiple stages where people consider the advantages and disadvantages of new ideas before deciding whether or not to accept them (Millemann et al., 2022). This implies that the intention of travelers to adopt CBDM can also be evaluated through the five-stage innovation adoption process, which include from awareness to interest, evaluation, trial, and adoption. Awareness arises when individuals encounter innovations and develop an initial understanding of their functions (Rogers, 1962). Exposures to external influences, such as experiences with different digital currencies and payment systems as well as commercial and non-commercial communications from the government and media contributed to public awareness of CBDM (Radic, Quan, Ariza-Montes, et al., 2022).

Interest arises when communication and marketing activities capture the attention of individuals and encourage them to explore and learn about innovations (Song et al., 2021). Travelers actively seek out and process information about CBDM from various sources during this phase by closely monitoring updates on policies and regulations (Radder, 2003). The awareness stage represents the recognition phase from a psychological perspective, whereas the interest stage highlights the emotional aspect of engagement.

The evaluation process involves a critical analysis of the pros and cons of CBDM for both local and cross-border travel payments. The ongoing quest of travelers for information contributes to a broader knowledge base about the technology and the entities that issue it (Bijlsma et al., 2021). CBDM is generally considered more secure and less risky than alternative digital currencies (Ma et al., 2022), which will result in a positive evaluation of the technology. Moreover, the current engagement of travelers with various digital payment systems, such as cryptocurrencies and mobile apps can aid them in regards to analyzing existing information, which makes it easier to evaluate CBDM (Auer et al., 2020; Náñez Alonso et al., 2021).

Customers can test the functionality and usability of CBDM technologies in a low-risk environment during the trial stage before committing to full-scale adoption. Economies that are piloting the CBDM project offer opportunities to experiment with the technology (Tong & Jiayou, 2021). For instance, the Chinese version of CBDM, which is e-CYN, has its interoperability with established digital payment systems, such as WeChat during the trial period, which is expected to encourage public adoption (Allen et al., 2022). The Korean central bank has partnered with seven domestic banks since April 2025 in order to pilot the Korean digital won with 100,000 customers for retail purchases. If these trials are successful, they will move toward the mass adoption of the technology across various sectors. This staged process captures the evolving cognitive and affective states travelers experience as they progress toward CBDM adoption, which is based on the innovation diffusion theory (Rogers, 1962) and recent calls for dynamic adoption models (Millemann et al., 2022). This framework complements the theory of planned behavior (TPB) by providing a processual view that extends beyond the intention–behavior gap, which addresses how early-stage awareness and interest translate into adoption decisions.

The following hypotheses are therefore proposed, which are based on the discussions above.

H1. *: CBDM awareness has a positive influence on CBDM interest.*

H2. *: CBDM interest has a positive influence on CBDM evaluation.*

H3. *: CBDM evaluation has a positive influence on CBDM trial.*

H4. *: CBDM trial has a positive influence on CBDM adoption.*

2.5. Relationship between CBDM awareness and attitude, subjective norms, and perceived behavioral control

Individuals hold both instrumental and experiential beliefs that shape their attitudes, subjective norms, and perceived behavioral control in the general TPB (Ajzen & Schmidt, 2020). Instrumental beliefs are based on an individual's subjective probability that performing a specific behavior will lead to a particular outcome, whereas experiential beliefs stem from personal experiences. Instrumental beliefs often emerge when users have a basic understanding of an innovation, but they lack comprehensive knowledge about it. This forms the basis of the concept of awareness in the staged approach to innovation adoption (Rogers, 1962). The instrumental beliefs of travelers during the awareness stage can consequently significantly influence their attitudes, subjective norms, and perceived behavioral controls in the general TPB.

The awareness of consumers in regards to CBDM can more easily translate into positive attitudes by expanding persuasions (Roh et al., 2022). According to Rogers et al. (2014), individuals who wish to adopt an innovation typically start by learning about it and developing a positive attitude before deciding to proceed with the adoption. Furthermore, wider media coverage and effective communication can shape the awareness of travelers and influence their perceptions of public attitudes and behaviors regarding CBDM (Radic, Quan, Ariza-Montes, et al., 2022). This affects their attitudes and subjective norms as a result. Various social groups with strong norms also emerge, which impact the decision-making processes of individuals, as awareness grows (Dinev & Hu, 2007). This mechanism illustrates how the staged adoption model and the TPB intersect, and CBDM awareness acts as an antecedent that shapes the core TPB constructs, which thereby bridges early-stage cognition with motivational determinants of behavior.

As a result, the following hypotheses are presented, which are based on the discussion above.

H5. *: CBDM awareness has a positive influence on attitude toward CBDM adoption.*

H6. *: CBDM awareness has a positive influence on subjective norm.*

H7. *: CBDM awareness has a positive influence on perceived behavioral control.*

2.6. Relationships between attitude toward CBDM adoption, subjective norms and perceived behavioral control, and CBDM adoption

The fundamental idea of the TPB is that an individual's intention to engage in a specific behavior influences their actual behavior (Ajzen, 1991). Furthermore, the major factors that predict these behavioral intentions consist of attitudes, subjective norms, and perceived behavioral control (Ajzen & Schmidt, 2020). The attitudes, social norms, and perceived behavioral control regarding CDBM therefore are expected to affect their behavior and decisions that are related to adoption, which are based on the principles of the TPB.

First, individuals with a favorable attitude toward an innovation are more inclined to adopt a technology. This relationship holds true for different technologies, such as mobile wallets (Chawla & Joshi, 2021) and cryptocurrencies (Namahoot & Rattanawiboonsom, 2022). CBDM payments are often associated with lower transaction fees, improved efficiency, lower transaction costs, convenience, and enhanced security and safety features over competing digital currencies, such as Bitcoin (Auer et al., 2020; Lee et al., 2021; Ozturkcan et al., 2022). Travelers can develop a favorable attitude toward CBDM technologies by acknowledging these benefits (Kim et al., 2024; Radic et al., 2021).

the intention of customers to adopt CBDM could also be affected by social influences. CBDM is still in the research and pilot study phases in most central banks, but there are compelling arguments that CBDM will be the future of legal tender worldwide (BIS, 2021). Central banks have committed to expanding the use of CBDM in order to realize financial inclusion and stability. This commitment would further create public awareness and positively influence the adoption intentions and actual behaviors of individuals (Lee et al., 2021; Ozili, 2023). On the other hand, social counsel or negative word of mouth significantly affects the CBDM adoption decisions of consumers (Allen et al., 2022; Söilen & Benhayoun, 2021). These findings align with the prior empirical findings on the role of social norms in regards to technology adoption (Lam et al., 2007).

The perceived ease or difficulty of using central bank digital money (CBDM) as a payment method influences the sense of behavioral control of individuals, which in turn affects their intention to use it in the future (Choi & Shin, 2023; Zamzami, 2020). Moreover, travelers perceived behavioral control may relate to their feelings of security and safety when they use CBDM for both local and international payments. CBDM is issued and regulated by central banks, so it is expected to function within a government-controlled framework, which thereby enhances the sense of security and confidence of users. This boost in confidence can further strengthen their perception of control and influence their adoption decisions. It is commonly believed that CBDM undermines the

principle of anonymity in payment systems, so the recent research by Allen et al. (2022) suggests that implementing anonymous transactions in CBDM is in particular feasible for small-volume retail purchases. We postulated the following hypotheses based on these insights.

H8. *: Attitude toward CBDM adoption has a positive influence on CBDM adoption.*

H9. *: Subjective norms have a positive influence on CBDM adoption.*

H10. *: Perceived behavioral control has a positive influence on CBDM adoption.*

2.7. Moderating effect of fear of missing out (FOMO)

The studies indicate that the assessments of technologies by individuals and their related attitudes often significantly vary according to specific circumstances and the emotional states of users (Radic, Quan, Ariza-Montes, et al., 2022). One notable emotional state that influences these assessments is the fear of missing out (FOMO). This concept has garnered considerable amount of attention in social psychology and marketing research (Neumann et al., 2023; Zhang et al., 2020). FOMO refers to the emotional and psychological belief that an individual's peers are having better experiences or gaining more resources (Przybylski et al., 2013).

A positive attitude about CBDM payments among travelers is generally due to real and perceived benefits that are derived from the technology. Thus, favorable attitudes might evoke people's feelings of FOMO and drive adoption. On the other hand, FOMO is linked to the relatedness component of the self-determination theory (Ryan & Deci, 2000), which reflects the negative emotions that occur when individuals believe that avoiding a particular technology or decision-making process may jeopardize their connection to user groups, and it them feel as if they are missing out on important opportunities (Gartner et al., 2022). Hence, the adoption and use of CBDM by important people can enhance their FOMO and facilitate technology adoption, because people want to align themselves with the technology as well as also with the broader user community.

H11a-d. *: Fear of missing out has a significant influence on the relationship between attitude (H11a), subjective norm (H11b), perceived behavioral control (H11c), and CBDM trial (H11d) and CBDM adoption.*

2.8. Moderating effect of confidence about increased CBDM use in the digital age

The confidence of travelers in this study in regards to the increased use of CBDM in the current digital age is proposed in order to moderate the structural relationships in the theoretical model. First, the attitudes, personal orientations, and predispositions of individuals toward technologies differ with their expectations of future benefits and associated risks (Weiss, 1994). For example, positive predispositions toward CBDM are mainly attributed to its expected future benefits in regards to avoiding frictions in the financial market and payment systems (Infante et al., 2024), which could increase future adoption. The mass adoption of technology that exhibits social influence can also shape the confidence of travelers in regards to CBDM and their future adoption intentions and actions. On the other hand, trust enhances the control of customers over the technology (Quan et al., 2023), and customers often associate higher trustworthiness with CBDM than with privately issued digital currencies (Auer et al., 2020).

Higher behavioral control from relatively higher perceived trust increases individual's and the public's confidence in regards to CBDM's future potential and adoption. Around 44 nations worldwide are more importantly currently in the piloting stage of their CBDC projects (Atlantic Council, 2025). If the pilot programs proceed smoothly, general consumers may have the opportunity to test the technology in a secure, regulated, and low-risk environment. This would help them feel more confident about the potential of CBDM, which ultimately facilitates the successful adoption of the technology. The following hypotheses are proposed, which are based on the discussions above.

H12a-d. *: Confidence about increased CBDM use in the digital age has a significant effect on the linkages between attitude (H12a), subjective norms (H12b), perceived behavioral control (H12c), and CBDM trial (H12d) and CBDM adoption.*

2.9. Moderating effect of attachment to CBDM

Attachment refers to the cognitive and emotional bond that connects users with a particular thing (Sánchez-Prieto et al., 2019; Thomson et al., 2005; Yuan et al., 2023). Attachment, which is grounded in the attachment theory by Bowlby (1982), involves the strong association and prolonged relationship that individuals form with others, which stems from affection and interactions. These connections can significantly influence the behavioral responses of individuals. The attachment theory posits that individuals have a strong desire for social interaction and finding closeness with others (Lou et al., 2005). Wu et al. (2016) argued that the attachment theory can also serve as a valid framework in regards to understanding the interactions between individuals and various devices or material objects.

Attachment can also be conceptualized as the extent that the activities of travelers are interconnected with CBDM in the present study. Individuals may develop varying levels of attachment to CBDM based on their relationship with the technology. The self-operating and self-managing nature of digital currencies is believed to foster a personal connection to the technology by facilitating interactions between users and the currency (Sánchez-Prieto et al., 2019). This connection can influence the intention of users to try the technology, their attitudes, subjective norms, perceived behavioral control, and overall adoption intention. Psychological studies have identified two stable attachment styles, which include attachment anxiety and attachment avoidance (Jacobvitz et al., 2002). Individuals with higher attachment anxiety tend to rely heavily on others or material objects due to a lack of confidence, whereas the attachment avoidance group feels self-reliant and tries to avoid attachment to people and objects (Wu et al., 2016). This group may view CBDM as being an integral part of their lives, and it is willing to use it for payments. Individuals with attachment avoidance in contrast lack trust in objects and actively try to avoid dependency on technology. This study according presents the following hypotheses and develops a conceptual model, which is illustrated in Fig. 1, based on these findings.

H13a-d. *: Attachment to CBDM has a significant effect on the linkages between attitude (H13a), subjective norm (H13b), perceived behavioral control (H13c), and CBDM trial (H13d) and CBDM adoption.*

3. Research methodology

3.1. Measurement items and research methodology

This study incorporates 11 constructs into its theoretical model, which include CBDM awareness, CBDM interest, CBDM evaluation, CBDM trial, attitude toward CBDM adoption, subjective norms, perceived behavioral control, CBDM adoption, fear of missing out, confidence in the increasing use of CBDM, and attachment to CBDM. All constructs were measured using a 7-point Likert's scale, which ranges from (1) *strongly disagree* to (7) *strongly agree*.

The measurement items were adopted from the previous validated research (Ajzen, 1991; Al-Ansi & Han, 2019; Han, 2020; Han et al., 2021; Kim, 2021; Morgan & Hunt, 1994; Oliver, 2010; Ozanne & Churchill Jr, 1971; Quan et al., 2023; Radder, 2003), which were slightly modified in order to suit the context of CBDM in tourism. These adaptations ensured alignment with the research objectives as well as maintained the reliability and validity that was established in the

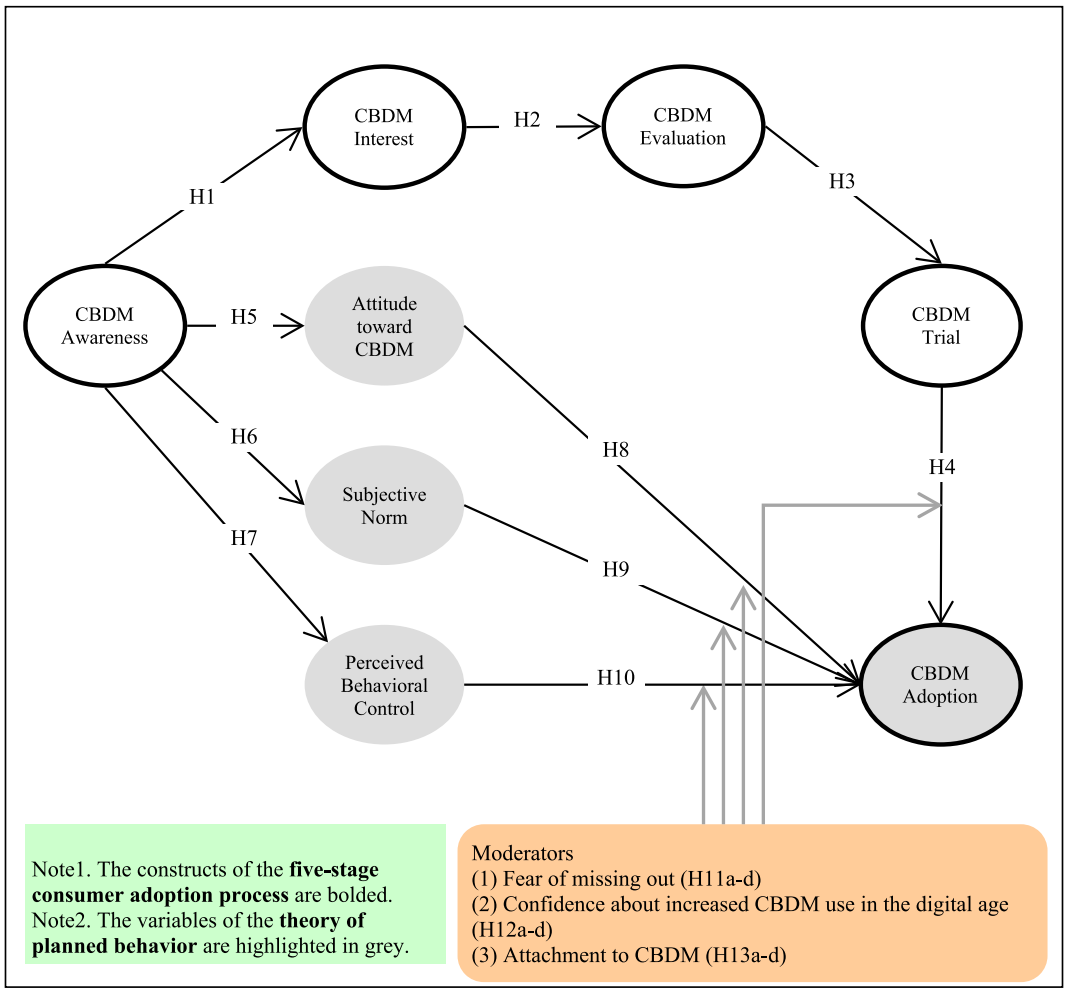

Fig. 1. The proposed conceptual model.

previous studies.

A small-scale pre-test ($n = 15$) was conducted with participants who met the inclusion criteria before the full-scale data collection in order to evaluate the clarity and readability of the questionnaire items. Feedback from the pre-test led to minor revisions in the wording of several items in order to enhance the comprehension. The measurement scales were already validated, so the aim of the pre-test was primarily to confirm the contextual relevance and linguistic clarity of the items.

This study employs a covariance-based structural equation modeling (CB-SEM) approach in order to examine the relationships among the constructs. CB-SEM was appropriate due to the theory-confirming nature of this study and the use of previously validated constructs (Dash & Paul, 2021; Han, 2020; Oliver, 2010). The data was analyzed using AMOS 26.0 and SPSS 26.0 in order to assess the measurement model and test the hypotheses.

3.2. Data collection and the demographic profiles of the respondents

The data was collected via an online survey that was administered by a professional research firm over one month. The target population included individuals with awareness of or experience with digital U.S. dollars or digital Korean won. The survey was distributed using a non-probability purposive sampling technique, and the study required the participants who were already familiar with the concept of central bank digital money (CBDM). This approach ensured the relevance and quality of responses related to the research context.

The original English questionnaire was translated into Korean by bilingual doctoral students in order to maximize the understanding of it, which was verified by tourism and finance experts. Participation was voluntary, and anonymity and confidentiality were guaranteed. The average completion time for the questionnaire was approximately 15 min.

A total of 691 responses were initially collected. Screening questions were included at the beginning of the survey, which included (1) *are you over 18 years old?* (2) *have you heard of or do you know about CBDM?* 159 responses (23 %) were excluded based on these. An additional 17 responses were removed due to duplication or missing values. The final sample consisted of 515 valid responses.

The demographic analysis showed a balanced gender distribution, which consisted of 53.0 % male participants and 47.0 % female participants and an average age of 37. Most of the respondents had university (51.5 %) or graduate-level education (17.7 %). The income distribution was diverse, and the largest group (19.8 %) earned $55,000–$69,999 annually. 37.1 % of the valid responses had experience using CBDM, whereas 62.9 % of them were aware of it but had not used it.

4. Results

4.1. Estimation of the measurement model and data quality

The confirmatory factor analysis was conducted in order to assess the data quality. The results of the analyses, which are shown in Table 1 and Table 2, show that the constructed measurement model had satisfactory fit indicators [$\chi^2 = 703.323$ (df = 450, $p < 0.001$), $\chi^2/df = 1.563$, NFI =

Table 1
Assessment of the correlations and quality of measures.

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
[1] CBDM awareness	0.812										
[2] CBDM interest	0.661**	0.908									
[3] CBDM evaluation	0.724**	0.754**	0.903								
[4] CBDM trial	0.702**	0.743**	0.744**	0.911							
[5] attitude	0.755**	0.769**	0.617**	0.682**	0.872						
[6] subjective norm	0.635**	0.671**	0.695**	0.668**	0.555**	0.888					
[7] Perceived BC	0.717**	0.696**	0.684**	0.713**	0.537**	0.648**	0.829				
[8] CBDM adoption	0.712**	0.741**	0.753**	0.688**	0.678**	0.671**	0.707**	0.916			
[9] fear of missing out	0.387**	0.359**	0.364**	0.290**	0.379**	0.227**	0.127*	0.298**	0.879		
[10] confidence	0.765**	0.640**	0.650**	0.727**	0.544**	0.647**	0.678**	0.643**	0.319**	0.887	
[11] attachment	0.659**	0.504**	0.632**	0.479**	0.651**	0.363**	0.497**	0.639**	0.328**	0.370**	0.891
CR	0.885	0.934	0.930	0.936	0.927	0.937	0.867	0.940	0.910	0.917	0.939
AVE	0.659	0.825	0.816	0.829	0.760	0.788	0.687	0.840	0.772	0.787	0.794

Note. Attitude: Attitude toward CBDM adoption, perceived BC: Perceived behavioral control, confidence: Confidence about CBDM rising in the digital age, and attachment: Attachment to CBDM.
AVE: Average variance extracted and CR: Composite reliability.
Coefficient in *Italic*: $\sqrt{AVE}$.
*$p < 0.05$ and **$p < 0.01$.

Table 2
Estimation of the measurement model and data quality.

	β		β		β
CBDM awareness1	0.823	attitude1	0.888	Fear of missing out1	0.906
CBDM awareness2	0.862	attitude2	0.863	Fear of missing out2	0.870
CBDM awareness3	0.827	attitude3	0.857	Fear of missing out3	0.859
CBDM awareness4	0.730	attitude4	0.878	confidence1	0.909
CBDM interest1	0.908	Subjective norm1	0.883	confidence2	0.890
CBDM interest2	0.904	Subjective norm2	0.895	confidence3	0.862
CBDM interest3	0.913	Subjective norm3	0.892	attachment1	0.892
CBDM evaluation1	0.920	Subjective norm4	0.880	attachment2	0.909
CBDM evaluation2	0.901	Perceived behavioral control1	0.807	attachment3	0.913
CBDM evaluation3	0.888	Perceived behavioral control2	0.901	attachment4	0.848
CBDM trial1	0.917	Perceived behavioral control3	0.773		
CBDM trial2	0.910	CBDM adoption1	0.918		
CBDM trial3	0.905	CBDM adoption2	0.917		
		CBDM adoption3	0.915		

Note 1. *Goodness-of-fit statistics for the baseline model:* $\chi^2 = 703.323$ (df = 450, p < 0.001), χ^2/df = 1.563, NFI = 0.963, IFI = 0.986, TLI = 0.982, CFI = 0.985, and RMSEA = 0.033.
Note 2. Attitude: Attitude toward CBDM adoption, confidence: Confidence about CBDM rising in the digital age, and attachment: Attachment to CBDM.

0.963, IFI = 0.986, TLI = 0.982, CFI = 0.985, and RMSEA = 0.033]. The factor loading indicators of all measures of the 11 constructs, which included CBDM awareness, CBDM interest, CBDM evaluation, CBDM trial, attitude toward CBDM adoption, subjective norms, perceived behavioral control, CBDM adoption, fear of missing out, confidence about increasing CBDM use, and attachment to CBDM, ranged from 0.730 to 0.920, which were deemed satisfactory. This was above the recommended value of 0.50 (Hair et al., 2012). Furthermore, the average variance extracted values were greater than the critical value of 0.50 that was suggested by Hair et al. (2012), which ranged from 0.659 to 0.840. The results indicated excellent internal consistency in the data sample. The composite reliability values were also above the critical value of 0.70 that was recommended by Hair et al. (2012), which ranged from 0.867 to 0.940. This indicates that the measurement of structure had adequate convergent validity. Fornell and Larcker (1981) demonstrated that a superior discriminant validity among all measures could only be true if the $\sqrt{AVE}$ value was higher than the correlation coefficients between all the constructs. The data sample in this study satisfied this requirement, which established adequate discriminant validity in the data sample.

4.2. Examination of the structural equation modeling and latent paths

Structural equation modeling (SEM) was used in order to test the hypotheses, which was based on the proposed research model. The results are presented in Table 3. The goodness-of-fit indicators for the SEM were satisfactory [$\chi^2 = 618.854$ (df = 314, p < 0.001), χ^2/df = 1.971, NFI = 0.961, IFI = 0.981, TLI = 0.978, CFI = 0.980, and RMSEA = 0.043]. The detailed results of the hypothesis were as follows. There was a significant effect relationship between CBDM awareness and CBDM interest (β = 0.784** and $p < 0.01$), so Hypothesis 1 was supported. CBDM interest (β = 0.777** and p < 0.01) had a significant effect on CBDM evaluation, and CBDM evaluation (β = 0.766** and p < 0.01) had a significant effect on CBDM trial. CBDM trial (β = 0.749** and p < 0.01) also positively affected CBDM adoption. As a result, Hypotheses 2, 3, and 4 were therefore supported. CBDM awareness exhibited significant positive effects on attitude toward CBDM adoption (β = 0.695** and p < 0.01), subjective norms (β = 0.691** and p < 0.01), and perceived behavioral control (β = 0.729** and p < 0.01), so Hypotheses 5, 6, and 7 were therefore supported. However, attitude toward CBDM adoption (β = 0.022 and $p > 0.05$), subjective norms (β = 0.012 and p > 0.05), and perceived behavioral control (β = 0.029 and p > 0.05) showed no significant effect on CBDM adoption, so Hypotheses 8, 9, and 10 were therefore not supported. We found that all the antecedent variables explained a total of 76.1 % in regards to the total variance explained for CBDM adoption. This established that all the drivers were able to predict the outcome variables in a satisfactory manner.

The indirect effects are presented in Table 3, which indicate that CBDM awareness had significant indirect effects on CBDM evaluation (β = 0.762** and 95 % CI: 0.608–0.782), CBDM trial (β = 0.762** and 95 % CI: 0.676–0.838), and CBDM adoption (β = 0.762** and 95 % CI: 0.701–0.776). There were in contrast no significant indirect effects for the pathways that included attitude toward CBDM adoption (β = 0.018 and 95 % CI: −0.024–0.077), subjective norm (β = 0.008 and 95 % CI: −0.023–0.042), and perceived behavioral control (β = 0.021 and 95 %

Table 3
Examination of structural equation modeling and latent paths.

			β	t-values
H1: CBCBDM awareness	→→	CBCBDM interest	0.784	14.065**
H2: CBDM interest	→→	CBDM evaluation	0.777	11.935**
H3: CBDM evaluation	→→	CBDM trial	0.766	12.018**
H4: CBDM trial	→→	CBDM adoption	0.749	14.435**
H5: CBDM awareness	→→	attitude toward CBDM adoption	0.695	8.195**
H6: CBDM awareness	→→	subjective norm	0.691	5.520**
H7: CBDM awareness	→→	perceived behavioral control	0.729	14.943**
H8: attitude toward CBDM adoption	→→	CBDM adoption	0.022	0.861
H9: subjective norm	→→	CBDM adoption	0.012	0.551
H10: perceived behavioral control	→→	CBDM adoption	0.029	1.214
Indirect Path			**β**	**Lower**	**Upper**
CBDM awareness → CBDM interest → CBDM evaluation			0.762**	0.608	0.782
CBDM awareness → CBDM interest → CBDM evaluation → CBDM trial			0.762**	0.676	0.838
CBDM awareness → CBDM interest → CBDM evaluation → CBDM trial → CBDM adoption			0.762**	0.701	0.776
CBDM awareness → attitude toward CBDM adoption → CBDM adoption			0.018	−0.024	0.077
CBDM awareness → subjective norm → CBDM adoption			0.008	−0.023	0.042
CBDM awareness → perceived behavioral control → CBDM adoption			0.021	−0.009	0.078
CBDM interest → CBDM evaluation → CBDM trial			0.643**	0.594	0.697
CBDM interest → CBDM evaluation → CBDM trial → CBDM adoption			0.643**	0.520	0.767
CBDM evaluation → CBDM trial → CBDM adoption			0.643**	0.548	0.689

Total variance explained: R^2 for CBDM interest = 0.615, R^2 for CBDM evaluation = 0.604, R^2 for CBDM trial = 0.587, R^2 for attitude = 0.483, R^2 for subjective norm = 0.477, R^2 for perceived behavioral control = 0.531, R^2 for CBDM adoption = 0.761.
Total impact on CBDM adoption: $\beta_{\text{CBDM awareness}} = 0.728^{**}$, $\beta_{\text{CBDM interest}} = 0.695^{**}$, $\beta_{\text{CBDM evaluation}} = 0.616^{**}$, $\beta_{\text{CBDM trial}} = 0.749^{**}$, $\beta_{\text{attitude}} = 0.022$, $\beta_{\text{subjective norm}} = 0.012$, $\beta_{\text{perceived behavioral control}} = 0.029$.
Goodness-of-fit statistics for the baseline model: $\chi^2 = 618.854$ (df = 314, $p < 0.001$), $\chi^2/df = 1.971$, NFI = 0.961, IFI = 0.981, TLI = 0.978, CFI = 0.980, and RMSEA = 0.043.
*p < 0.05 and **p < 0.01.

CI: −0.009–0.078). In addition, CBDM interest had a significant positive indirect effect on CBDM trial (β = 0.643** and 95 % CI: 0.594–0.697) and CBDM adoption (β = 0.643** and 95 % CI: 0.520–0.767), and CBDM evaluation demonstrated a meaningful indirect effect on CBDM adoption (β = 0.643** and 95 % CI: 0.548–0.689). The results for the total effect were 0.728 ($p < 0.01$) for CBDM adoption, 0.695 ($p < 0.01$) for CBDM interest, 0.616 ($p < 0.01$) for CBDM evaluation, and 0.749 ($p < 0.01$) for CBDM trial. The total effect on the constructs of the above five factors was significant, but the total effect of attitude toward CBDM adoption, subjective norms, and perceived behavioral control was non-significant.

4.3. Invariance test: Moderating effects of FOMO, confidence about DC rising in the digital age, and attachment to CBDM

The moderating variables in the research model, which included FOMO, confidence about increasing use of CBDM, and attachment to CBDM, were examined. We first categorized the data for the three variables into low and high groups. The low group was marked as 1, the high group was marked as 2, and a K-means cluster analysis in SPSS 26.0 was used. The classified data was next imported into AMOS 26.0, and an invariance test was conducted in order to compare the variation of the chi-square values between the baseline model and the nested model. The results are shown in Table 4. We found no significant moderating effects of FOMO on attitude toward CBDM adoption ($\Delta\chi2[1] = 0.022$), subjective norms ($\Delta\chi2[1] = 3.011$), perceived behavioral control ($\Delta\chi2[1] = 0.467$), and CBDM trial ($\Delta\chi2[1] = 2.078$) on CBDM adoption. Hypotheses 11a, 11b, 11c, and 11d were therefore not supported. Confidence about increasing CBDM use had a significant moderating effect only on subjective norms and CBDM adoption ($\Delta\chi2[1] = 5.910^*$), so Hypothesis 12b was supported. The results indicated no significant moderating effect for confidence about increasing CBDM use on the relationship between attitude toward CBDM adoption ($\Delta\chi2[1] = 0.213$), perceived behavioral control ($\Delta\chi2[1] = 0.447$), and CBDM trial ($\Delta\chi2[1] = 0.053$) and CBDM adoption, so Hypotheses 12a, 12c, and 12d were not supported. Attachment to CBDM demonstrated sufficient moderating effects in the two paths of subjective norms ($\Delta\chi2[1] = 5.203^*$) and perceived behavioral control ($\Delta\chi2[1] = 4.060^*$) on CBDM adoption, so Hypotheses13b and 13c were consequently supported. Attachment to CBDM in contrast failed to have a significant moderating effect on the relationship between attitude toward CBDM adoption ($\Delta\chi2[1] = 0.022$) and CBDM trial ($\Delta\chi2[1] = 0.052$) and CBDM adoption, so Hypotheses13a and 13d were rejected.

5. Discussion and implications

5.1. Synthesis of the study

This study innovatively used the theory of planned behavior (TPB) in order to explore the adoption of tourists in regards to central bank digital money (CBDM) over multiple stages of awareness, interest, evaluation, trial, and adoption. This combined approach provides a more dynamic understanding of the adoption process, which reflects the complex consumer journey as opposed to just a static behavioral intention. The study revealed that CBDM adoption is a sequential and multi-stage process, which is where trial experiences are the most critical predictor of adoption, whereas attitudes, subjective norms, and perceived behavioral control, do not directly lead to adoption despite being influenced by awareness. This lack of significant direct effects for attitudes, subjective norms, and perceived behavioral control on CBDM adoption contrasts with many TPB-based studies but aligns with the findings in emerging technology contexts where psychological intentions do not always translate into actual behavior. This discrepancy highlights the well-known attitude-behavior gap and suggests that actual trial experience plays a more decisive role in regards to adoption decisions than cognitive or normative factors alone in the context of CBDM. Moreover, the insignificance of these constructs may indicate that consumers are still in the early stages of CBDM adoption, which is where experiential knowledge and perceived risks weigh more heavily than attitudinal factors.

This finding emphasizes the attitude-behavior gap in the context of CBDM, which is a meaningful theoretical contribution. The previous studies did not sufficiently addressed this gap, which makes our result unique. This suggests an attitude-behavior gap in the context of CBDM, which emphasizes that actual experience as opposed to psychological intention alone plays a decisive role in the adoption process. Furthermore, the study investigated the fear of missing out (FOMO), confidence about increasing CBDM use, and attachment to CBDM as moderating factors. It was discovered that FOMO did not significantly influence adoption, but confidence and attachment selectively strengthened the influence of subjective norms and perceived behavioral control. These nuanced moderating effects further demonstrate the complexity of

Table 4
Invariance test: Moderating effects of the fear of missing out, confidence about CBDM rising in the digital age, and attachment to CBDM.

Fear of missing out				low group (n = 269)		high group (n = 246)		Baseline model	Nested model	Δχ2 (1)	p-value	Results
				β	t-values	β	t-values					
H11a	attitude	→	CBDM adoption	0.015	0.553	0.024	0.391	χ2(628) = 1015.145	χ2(629) = 1015.167	0.022	p > 0.05	Not supported
H11b	subjective norm	→	CBDM adoption	0.065	2.003*	0.019	0.602	χ2(628) = 1015.145	χ2(629) = 1018.156	3.011	p > 0.05	Not supported
H11c	perceived BC	→	CBDM adoption	0.045	1.478	0.014	0.362	χ2(628) = 1015.145	χ2(629) = 1015.612	0.467	p > 0.05	Not supported
H11d	CBDM trial	→	CBDM adoption	0.661	9.870**	0.677	12.466**	χ2(628) = 1015.145	χ2(629) = 1017.223	2.078	p > 0.05	Not supported
Confidence about increased CBDM use in the digital age				low group (n = 363)		high group (n = 152)		Baseline model	Nested model	Δχ2 (1)	p-value	Results
				β	t-values	β	t-values					
H12a	attitude	→	CBDM adoption	0.038	0.895	0.000	−0.011	χ2(628) = 1043.965	χ2(629) = 1044.178	0.213	p > 0.05	Not supported
H12b	subjective norm	→	CBDM adoption	0.025	0.818	0.109	2.474*	χ2(628) = 1043.965	χ2(629) = 1049.875	5.910	p < 0.05	Supported
H12c	perceived BC	→	CBDM adoption	0.047	1.312	0.005	0.150	χ2(628) = 1043.965	χ2(629) = 1044.412	0.447	p > 0.05	Not supported
H12d	CBDM trial	→	CBDM adoption	0.751	14.679**	0.704	15.498**	χ2(628) = 1043.965	χ2(629) = 1044.018	0.053	p > 0.05	Not supported
Attachment to CBDM				low group (n = 226)		high group (n = 289)		Baseline model	Nested model	Δχ2 (1)	p-value	Results
				β	t-values	β	t-values					
H13a	attitude	→	CBDM adoption	0.026	0.758	0.033	0.682	χ2(628) = 1035.893	χ2(629) = 1035.915	0.022	p > 0.05	Not supported
H13b	subjective norm	→	CBDM adoption	0.039	1.634	0.119	2.031*	χ2(628) = 1035.893	χ2(629) = 1041.096	5.203	p < 0.05	Supported
H13c	perceived BC	→	CBDM adoption	0.002	0.073	0.138	2.062*	χ2(628) = 1035.893	χ2(629) = 1039.953	4.060	p < 0.05	Supported
H13d	CBDM trial	→	CBDM adoption	0.751	11.835**	0.777	8.940**	χ2(628) = 1035.893	χ2(629) = 1035.945	0.052	p > 0.05	Not supported

Goodness-of-fit statistics for the baseline model (fear of missing out): $\chi^2/df = 1.616$, IFI = 0.974, TLI = 0.971, CFI = 0.973, RMSEA = 0.035.
Goodness-of-fit statistics for the baseline model (confidence about CBDM rising in the digital age): $\chi^2/df = 1.662$, IFI = 0.961, TLI = 0.956, CFI = 0.960, and RMSEA = 0.036.
Goodness-of-fit statistics for the baseline model (attachment to CBDM): $\chi^2/df = 1.650$, IFI = 0.967, TLI = 0.962, CFI = 0.966, and RMSEA = 0.036.
Note 1. Attitude: attitude toward CBDM adoption and perceived BC: perceived behavioral control.
*$p < 0.05$ and **p < 0.01.

CBDM adoption and highlight the limitations of TPB when it is used alone in emerging technology contexts. These findings suggest that increasing awareness and providing opportunities for direct trial are more effective strategies than just solely focusing on attitude change in order to promote CBDM adoption. The process of the gradual adoption of CBDM as a new technology is the main investigation of this study, which further confirms the practical importance of experience-based interventions in regards to driving adoption behavior. This study also considered the personal intentions and behavioral decisions of consumers to adopt CBDM during tourism through an extended TPB model and provided empirical evidence of the acceptance of CBDM by travelers as a method of payment. The key findings are as follows.

Firstly, the CBDM adoption process showed that each stage had significantly positive effects on the next stage. Awareness had a positive effect on interest, and interest affected evaluation. Evaluation had an effect on trial, which subsequently influenced adoption. Well-publicized information can lead travelers to think positively about CBDM. This is highly consistent with the five-stage theory, which is validated in the previous research (Frambach & Schillewaert, 2002; Kim et al., 2022; Radder, 2003; Zenobia & Weber, 2013). People naturally become interested and want to know more about CBDM once they recognize what cryptocurrencies are and how to use them. People then further evaluate that information after a certain amount of information gathering. If people evaluate cryptocurrency trading and CBDM positively, they can try it with a purchase amount that they are not concerned about. The trial results further increase their understanding of CBDM. They will be more inclined to adopt CBDM, because they are already familiar with it. Finally, people can accept and embrace it when they are assured of CBDM functionality, security, and freedom from risk. Controversy about the safety of CBDM is still ongoing, but more travelers might use it if awareness of the security of CBDM is improved. Kim et al. (2022) found that CBDM is an innovative product, and its adoption process follows the process of technology adoption (Kim et al., 2022).

Secondly, this current study found that CBDM awareness had significantly positive effects on attitude, subjective norms, and perceived behavioral control, which aligned with the previous research (Chawla & Joshi, 2021; Oladapo et al., 2022; Vetrichelvi & Priya, 2022; Xu et al., 2022). People's adoption of CBDM is not only influenced by their understanding of CBDM as a new technology, it but also depends on factors that can impact their own decisions. People understand what CBDM is, and they then try to find information about it. If the attributes of CBDM usage are sufficiently recognized, travelers will have positive attitudes toward CBDM. In other words, their resistance to the new financial system will be reduced, and they will be ready to adopt it. Furthermore, if many people recognize what CBDM is, a positive social atmosphere for CBDM use can be formed, which will lead to the standardization of CBDM. The more people understand CBDM, the more they will believe that they can handle it by themselves. Searching for information about CBDM helps travelers believe that they have enough information, which challenges them to try CBDM without fear.

Thirdly, three factors in the TPB model did not have a meaningful effect on CBDM adoption. This is conflicts with the results of the previous studies (Allen et al., 2022; Chawla & Joshi, 2021; Lee et al., 2021; Ozili, 2023; Radic et al., 2021). The TPB is widely accepted and applied in academic circles, but its application to CBDM may depend on other non-traditional factors (Radic et al., 2021). The adoption behavior of emerging technologies, such as CBDM could also be influenced by cognitive and policy factors within the technology dimension. These

elements play a crucial role in regards to understanding the adoption behavior of users. Furthermore, the fact that CBDM adoption is still in its early stages highlights the need for more robust policy support in regards to enhancing perceptions of the technology.

Lastly, some of the factors that influence the adoption of CBDM are moderated by some variables. FOMO had no moderating effect on any relationships. This is contrary to the results that were revealed in the previous studies (Radic, Quan, Ariza-Montes, et al., 2022). However, only the relationship between subjective norms and CBDM adoption showed a group difference, because there was a moderating effect on confidence about increased CBDM use. Confidence about increased CBDM use in the digital age did not significantly affect attitudes, perceived behavioral control, and CBDM trial toward CBDM adoption. This result is therefore consistent with some of the results that were derived from the previous studies (Quan et al., 2024). This finding suggests that the influence of social pressure on people's adoption decision in regards to adopting CBDM depends on the level of confidence the individual has with CBDM. In other words, if subjective norms favor CBDM adoption, insufficient confidence may hinder adoption. Sufficient confidence conversely enhances the effect of positive social pressure. Attachment to CBDM shows moderating effects in the relationship between subjective norm-CBDM adoption and perceived behavioral control-CBDM adoption. This implies an effective interaction between the cognitive and affective aspects of the decision-making process. This is consistent with the findings by Sánchez-Prieto et al. (2019). Furthermore, attachment can be considered as interest (Yuan et al., 2023), so this also means that individuals with higher beliefs about being able to control their behavior will be more tolerant of the social climate and external environment. This enables people to more readily adopt digital currencies.

5.2. Theoretical implications

This study extends the existing literature on digital currencies and specifically CBDM by combining the TPB with the five stages of the consumer adoption process. The approach of combining these two theories is novel in the hospitality and tourism industry. This is due to the adoption of CBDM still being in its infancy. The findings from this study contribute to a deeper understanding of the psychological and behavioral mechanisms that influence CBDM adoption. The specific theoretical implications are as follows. First, this study synthesizes these models in order to provide a comprehensive framework in regards to understanding CBDM adoption, which is in contrast to the previous studies that separately examined the TPB or consumer adoption stages. This approach allows us to uncover the complex interconnections between behavioral intention and the sequential adoption process, and it thus provides a more nuanced understanding of how each stage influences the subsequent stage. The novelty of this framework lies in its integration of attitudinal, social, and control-related factors with a sequential adoption process, which allow us to examine whether people intend to adopt CBDM as well as also how the cognitive pathway practically unfolds from initial awareness to actual adoption behavior. This study overcomes the traditional cross-sectional limitations of the TPB by tracking the step-by-step process, and it captures the temporal dynamics of consumer decision-making. This sequential view offers a fresh theoretical lens that is underexplored in the previous CBDM studies. Second, our findings suggest that traditional TPB factors, such as attitudes, subjective norms, and perceived behavioral control have no direct influence on the final adoption decision in the context of CBDM. This finding contrasts with the important role that these factors were found to play in other technology adoption in the previous studies (Lee et al., 2021; Radic et al., 2021). We speculated that this difference may be due to the unique characteristics of CBDM, such as its early stage of development and the pervasive regulatory uncertainty, which may weaken the predictive power of the TPB in this context. This result emphasizes one of the key limitations of the TPB, which is the model tends to oversimplify the adoption decision by heavily focusing on intention as a primary driver of behavior. Behavior may be driven less by intention and more by trial-based experiences, environmental enablers, or technological trust in complex, multi-stage, or emerging technology contexts, such as CBDM. The TPB assumes that attitudes and intentions consistently predict behavior, but this may not hold true when people lack sufficient confidence, experience, or contextual cues in order to act on their intentions. Our study illustrates this gap and suggests that the TPB should be extended with constructs, such as trial, confidence, attachment, and experiential learning in order to better explain behavior in these types of cases. Third, TPB has a limited influence on the adoption of CBDM, but other factors, such as technology trust and CBDM-specific attributes, which include security and ease of use,) may have a greater impact on adoption decisions. These insights can guide future research to explore alternative theoretical models that may better explain consumer behavior in emerging financial technologies. The technology acceptance model (TAM), the unified theory of acceptance and use of technology (UTAUT), or the innovation diffusion theory (IDT) could specifically be considered in combination with sequential models in order to explain future CBDM adoption more robustly. Future studies may also consider integrating trust, risk perception, and consumer attachment as primary predictors as opposed to being just secondary moderators. Fourth, this study confirms and extends the stage-of-adoption process by empirically testing it in the context of CBDM. We provide evidence that suggests that cognition significantly influences follow-on stages, such as interest, evaluation, trial, and ultimately adoption. This development highlights the importance of information advocacy and targeted marketing strategies in order to increase consumer adoption of CBDM. Moreover, this process-driven model provides practical implications for policymakers and marketers, which suggest that each stage requires a different strategic focus. Future research could apply this staged adoption model to other financial innovations, such as decentralized finance (DeFi) platforms or digital wallets, which may follow a similarly gradual and confidence-dependent adoption pathway. Finally, this study provides a foundation in order to utilize the financial innovation of CBDM in the hospitality and tourism industry. The previous research primarily focuses on legal validity (Zainutdinova, 2023) in the field of law, economic benefits, privacy issues, and government surveillance in economics (Keister & Sanches, 2023). The research on digital currencies in the hospitality and tourism industry is in particular virtually non-existent except for a few studies that are combined with blockchain technology. This study is original, because it identifies the adoption process of digital currencies in the hospitality industry and analyzes the relevant variables. This framework could be extended and applied to other rapidly evolving digital payment methods in the future, such as token-based payment systems, cross-border CBDM trials, or central bank-backed stablecoins. This model also provides a solid theoretical basis for longitudinal studies that can further explore how consumer perceptions evolve as CBDM becomes more widely implemented.

5.3. Practical implications

This study conducted empirical research on the process of the acceptance of digital currencies from awareness to adoption, and it contributes to how travelers perceive and accept CBDM. The concrete practical implications are as follows. Firstly, the hospitality industry can obtain basic and crucial data in order to improve its operations. Creating positive perceptions among international travelers is important in regards to promoting CBDM as a payment method. This is due to properly understood information increasing the probability of consumer acceptance. A high level of interest is generated with sufficient information and awareness of CBDM, which is expected to lead to the increased use of CBDM. Hotels and travel agencies should provide CBDM payment options directly at their websites, booking platforms, and on-site facilities with step-by-step usage guides in order to implement

this. In addition, hospitality businesses can develop easy-to-follow mobile payment tutorials that guide travelers through the CBDM transaction process in real-time. Secondly, it is essential to reflect the social climate and provide information about the benefits and drawbacks of CBDM in order to anticipate the problems that may arise when using CBDM. In addition, people now tend to be more familiar with the use of electronic devices, such as mobile phones and computers more than people in earlier decades. This implies that digital age travelers are more receptive to CBDM than others are. Thus, targeting travelers who are familiar with digital devices is more conducive in regards to promoting the use of CBDM. Thirdly, it is important for regulators to recognize the need to create a trustworthy environment for CBDM. Governments and related authorities should specifically launch CBDM trial programs at major international airports and tourist sites in order to encourage first-time use. These trials can provide limited-time incentives, such as transaction fee waivers or small cashback rewards in order to motivate adoption. Social media influencers in the travel sector can also be engaged to demonstrate CBDM transactions to their followers, which increases visibility and trust. Moreover, it is important for regulators to recognize the need to create a trustworthy environment for CBDM. This may involve strong security measures, transparent policies, and a stable technical infrastructure. For example, the government promotes the advantages and disadvantages of using CBDM through social media platforms, such as Instagram, X, and Facebook, so consumers can accept and become familiar with the information accurately and without pressure. Furthermore, policies and regulations that can prevent economic losses for consumers should be established first in order to alleviate their anxiety about using CDBM. Subjective norms could be effectively used this way in order to promote adoption by building and maintaining public confidence in CBDM. Regulators can practically develop certification systems for CBDM-compatible platforms, which are similar to how payment security certifications work in the existing credit card systems, in order to reassure travelers of safety. Regular campaigns that explain how consumer protection works in CBDM transactions should be conducted in simple language in order to reduce fear. Finally, developers could foster a sense of trust and belonging by creating engaging user interfaces and experiences. This will increase user attachment and behavioral intention to use CBDM as a result. Developers should prioritize creating a highly secure application that displays real-time exchange rates based on the country they are traveling to. It is necessary to establish a convenient financial system that allows travelers to quickly exchange currency through the application without having to go to a bank no matter where they are in the world. It is recommended that application developers implement a *CBDM Trial Mode* where users can simulate transactions before real usage, which reduces anxiety for first-time users. Features, such as multi-language support, 24/7 customer service chatbots, and personalized currency notifications should also be incorporated in order to enhance user convenience and satisfaction.

6. Conclusions

This study contributes to the digital currency literature, such as in particular with Central Bank Digital Money (CBDM) by developing an extended TPB framework that incorporates the five-stage consumer adoption process, which include awareness, interest, evaluation, trial, and adoption. The findings reveal that traditional TPB constructs, such as attitude, subjective norms, and perceived behavioral control are typically the key determinants in technology adoption, but they do not strongly predict CBDM adoption. This underscores the necessity of considering additional factors that are specific to the CBDM context. This study addresses this gap and emphasizes the moderating roles of individual confidence and attachment to technology, which sheds light on the intricate interaction between cognitive evaluations and emotional influences in the adoption process. These insights broaden the applicability of the TPB to emerging financial technologies, which highlight the crucial impact of both psychological and contextual confidence in regards to shaping adoption decisions. This study achieved its objectives by empirically testing an extended TPB framework by incorporating a staged adoption model, which revealed how each stage influences subsequent stages and ultimately adoption decisions. This comprehensive understanding aids in regards to developing the targeted strategies in order to enhance CBDM adoption, which offers valuable insights for both academics and practitioners in the financial technology sector.

7. Limitations and suggestions for future research

The empirical findings of this study provide valuable insights for the hospitality and tourism sector, but several limitations warrant acknowledgment. First, the study sample consisted of travelers who possess prior knowledge and experience with digital US dollars and digital Korean won. Nevertheless, the adoption of CBDM may differ significantly across countries, which reflects variations in regards to economic development levels and technological infrastructure (Allen et al., 2022; Dash et al., 2022; Lee et al., 2021). Moreover, cultural factors play a crucial role, because trust in government and technological systems varies among populations, which potentially affect CBDM adoption rates (Oladapo et al., 2022; Söilen & Benhayoun, 2021). Future research should consequently consider extending the proposed theoretical model to diverse national and cultural contexts. These factors should also be incorporated as moderators or control variables in subsequent empirical investigations in order to better elucidate their influence on CBDM adoption.

Second, adoption of new digital money can vary according to the personal traits of customers, such as previous experience, sociodemographic variables, and psychological variables, which include risk-taking or personality (Choi & Shin, 2023; Kim, 2021; Maleepumpun, 2023; Namahoot & Rattanawiboonsom, 2022). There is therefore a need to segment differences in the findings according to the individual factors of the customers. Third, an interesting finding was obtained in this study. The three factors of the theory of planned behavior had no significant effect on adoption behavior, so it is recommended that more diverse factors be incorporated into the theoretical framework of this study, such as technological aspects and macroeconomic conditions. Fourth, the data in this study is cross-sectional, because digital currencies are currently in the early stages of development. Future research can be conducted in a longitudinal approach in order to fully address this research question by observing changes in the perceptions of travelers and other changes in digital currency over time. Fifth, CBDM adoption is a process that unfolds over time, and cross-sectional studies still provide valuable insights, such as especially in the early stages of technology adoption when longitudinal data is difficult to obtain. This study offers a timely snapshot of the perceptions and behaviors of travelers, which is meaningful in regards to understanding the current adoption climate. Future studies can complement these findings by using longitudinal or sequential methods in order to further explore changes over time.

CRediT authorship contribution statement

Heesup Han: Funding acquisition, Data curation, Conceptualization. **Zemenu Amare Ayalew:** Writing – original draft. **Seongseop (Sam) Kim:** Writing – review & editing. **Wei Quan:** Visualization, Validation. **Tatiyaporn Jarumaneerat:** Writing – review & editing, Methodology. **Lanji Quan:** Resources. **Minkyoung Jin:** Methodology, Investigation.

Declaration of competing interest

None.

Appendix A. Supplementary materials

Supplementary materials to this article can be found online at https://doi.org/10.1016/j.actpsy.2025.105465.

Data availability

Data will be made available on request.

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