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Exploring the Convergence of Technology Acceptance and Financial Literacy: A Study on Sustainable Credit Card Use in an Emerging Economy

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ABSTRACT

This study investigates the integration of technology acceptance and financial literacy in the context of sustainable credit card use in Kuwait. It aims to identify and evaluate the key technological and financial determinants influencing user behavior and acceptance of credit cards as a fintech tool. A survey was conducted with 367 credit card users in Kuwait using the Technology Acceptance Model (TAM), examining variables such as Perceived Usefulness (PU), Perceived Ease of Use (PEU), Perceived Cost (PC), Perceived Risk (PR), and E-Financial Literacy (EFL). Structural Equation Modeling (SEM) was employed to analyze the data. The findings suggest that both technological and financial factors have significant effects on user acceptance. Specifically, PU and PEU significantly influenced users' attitudes towards credit cards, which in turn shaped their Behavioral Intention (BI) to use them. Financial aspects, notably PC and PR, are crucial in shaping the overall Perceived Value (PV), impacting BI. EFL plays a central role in mediating the effects of technological and financial perceptions on user attitudes and perceived value. The study concludes that the acceptance of credit cards in Kuwait is highly influenced by the interplay between technology acceptance factors and financial literacy. Users' attitudes towards financial technology are shaped by their perceptions of its usability, usefulness, associated costs, and risks. Enhancing financial literacy, particularly electronic financial literacy, could significantly foster broader acceptance of Fintech tools, such as credit cards.

Keywords: Fintech, Financial Technology Adoption, Technology Acceptance, E-Financial Literacy, Behavioral Intention in Credit Use
JEL Classifications: G00; G20; G21; O0

1. INTRODUCTION

The acceptance of contemporary payment methods, such as credit cards, combines inter-disciplinary factors because it combines both financial and technological aspects operating at the point of sale, resulting in a finance and technology nexus (Thakur, 2013). Traditionally, technology acceptance models focus on technological aspects and rarely include any aspects from the functional and social aspects of the domain to which the technology has been applied. Such an interdisciplinary approach can broaden the knowledge of technology acceptance and bring profound implications for domain-related knowledge such as finance.

Financial technology (Fintech) can broadly be defined as the use of technological applications to facilitate financial services, such as deposits and financing arrangements with institutions, thus requiring an interdisciplinary approach (Wójcik, 2021). Credit cards combine loans from financial institutions using digital platforms, such as point-of-sales networks of merchants and networks of financial institutions and credit guarantees. Therefore, a complete network of networks is established for

credit cards to work as a financing and payment method for customers. More broadly it works as an instrument for the overall financial system to financialise the transactions and have a record of those transactions at the system levels. Customers therefore have multifaced factors to consider while utilising such financial technology (Huei et al., 2018).

Two broad sets of factors seem to be relevant, requiring an inquiry into their collective role in the acceptance of fintech. First, the technology aspects and associated perceptions, such as its usefulness and ease of use, are theoretically important aspects when it comes to the acceptance of the technology by its users (Saadé and Kira, 2006). These and other perceptions related to use have been extensively researched in the literature (Baki et al., 2018; Hsia et al., 2014; Hu et al., 2019; Huei et al., 2018; Nanggala, 2020; Rouibah et al., 2011; Al-Enzi and Al-Enezi, 2024). Second, credit cards, as technologically based learning instruments, have associated financial aspects of acceptance. Being a loan product has its cost value and associated risk factor to be considered while accepting it as a mode of payment (Hu et al., 2019; Shaikh et al., 2020; Singh et al., 2020). Furthermore, these financial concerns lead to the overall value of credit cards and may affect their acceptance among users. However, there is little research on combining these technological and financial factors to make up a broader model for fintech acceptance, and how these two sets of factors are bound by user literacy about both technology and finance. This study raises the following question: What are the technological, financial, and financial literacy factors affecting the acceptance of credit cards in Kuwait. The next section presents the building of the focal model, hypotheses, and subsequent discussion of each variable of the model. Thereafter, a PLS SEM based methodology was developed, and a questionnaire was adapted.

2. MODEL AND HYPOTHESIS

This study combines the Technology Acceptance Model (TAM) with financial services literature related to the acceptance of credit. These two streams of literature must be combined because a credit card is essentially a fintech platform, and users have both technological and finance acceptance considerations in the process of adopting credit cards. First, three prominent factors of technology acceptance are discussed. Second, three factors associated with financial services are discussed to present a collective understanding of the factors affecting the acceptance of credit cards.

2.1. Perceived Ease of Use (PEU)

Perceived Ease of Use (PEU) is a prominent factor for users to accept technology. PEU arises from the users' perception of expected labor and rigor that may be required to utilize a technology (Davis, 1989). In the financial services context, PEU combines with other financial service considerations to establish a localized method for the acceptance of financial technology (Zahrani, 2021). PEU, in addition to being a factor of technology acceptance, has also been utilized by researchers to compare alternative technologies in terms of choosing one that has higher acceptance for delivering sound financial services (Susilo et al., 2019).

2.2. Perceived Usefulness (PU)

Perceived Usefulness (PU) is also considered an important factor for users' acceptance of technology by users (Nanggala, 2020). The perception of usefulness arises from the utilization of technology. Users form a perception of the expected benefits the technology will provide, which influences their decision to adopt the technology. Usefulness can be a stand-alone use of a technology or a comparative analysis of alternative technologies to form a basis for technology adoption (Susilo et al., 2019).

2.3. Attitude (A)

Users' attitude (A) towards the technology develops when both perceptions of usefulness and usage are clear. Attitude is the overall favorable or otherwise, evaluation of the technology by the users, keeping in view both the potential usefulness and ease of use. Attitude directs the user's behavior toward adopting a particular technology (Blut and Wang, 2020). In the financial service context, it has been found to mediate the relationship of both perceptions of ease and use towards the behavioral intention of a user to adopt a financial technology (Huei et al., 2018).

2.4. E-Financial Literacy (EFL)

Financial Literacy refers to the basic understanding of how financial services work. It primarily relates to interest in credit cards, the diversification of investments, and the time value of money (Setiawan et al., 2021). E-Financial Literacy (EFL) means having sufficient understanding and skills to avail financial services through the use of technology at the user interface level. Therefore, users are expected to have sufficient knowledge and skills associated with operationalizing their transactions at the user interface levels, such as point-of-sale terminals and online trade transactions, to enable a cashless market (Kumar et al., 2023). E-financial literacy helps users make a better sense of financial decision-making to save resources (Rahayu et al., 2022) and it is therefore expected to affect both the perceived value of the credit card as well as the user's attitude to form an intention to use credit cards.

2.5. Perceived Cost (PC)

Credit cards are essentially a financing product, where the users are facilitated to purchase goods and services and the financial institutions pay on the spot on the customers' behalf, while the customer pays the amount later. In this financing context, the customer also considers the overall cost of the credit available to them, which in turn determines whether to adopt this technology or not (Cao, 2016). The cost value inherently leads to the overall value of financing through cards in terms of the user evaluation of whether they will be able to pay back the liability. This, in turn, affects their decision to adopt the financing option and sets a direction for financial inclusion ("State of Kuwait: World Bank country engagement framework, 2021-2035," 2021).

2.6. Perceived Risk (PR)

Perceived risk is also considered important in financial technology, as it involves the movement of liquid assets with high price values and contributes to uncertainty about financial technology. It is therefore important that the security features of the platforms be given high weightage at both the design and operational levels of

the technology (Singh et al., 2020). In the case of credit cards, context-perceived security is primarily associated with the user's worry about the misuse of the card on a platform without any consent from the user.

2.7. Perceived Value (PV)

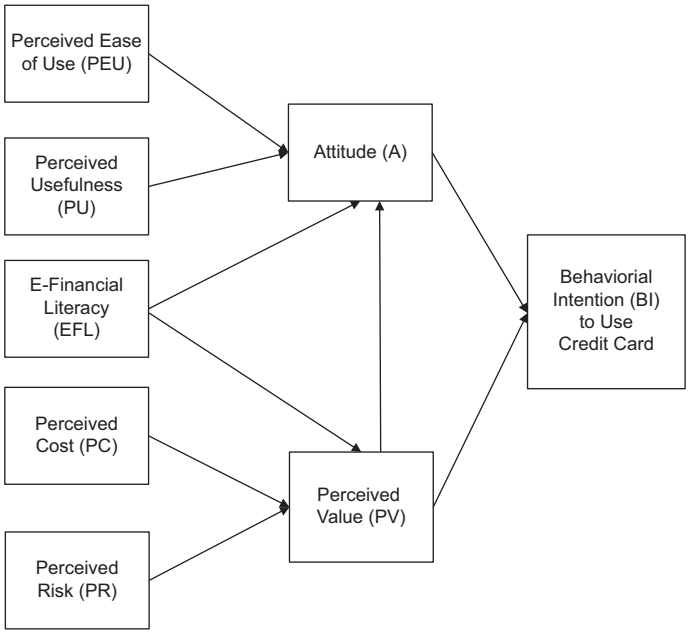
Value is the user ascertaining the expected outcomes of a financial transaction compared to its cost and risk. Both the cost value and perceived security of financial technology contribute to users' perception of value (Jo and Lee, 2021). Therefore, it plays a mediating role in building the overall intention of the user to adopt fintech; therefore, it is important to evaluate its role in the overall model for the acceptance of credit cards.

2.8. Behavioural Intention (BI)

Behavioral intention has been extensively used in technology acceptance research as an indicator of technology adoption (Al-Emran and Teo, 2020; AlShamali and AlMutairi, 2023; Carsten and Spector, 1987; Moharrak et al., 2025; Teo, 2010; Wang, 2016; Zahrani, 2021). The research evaluates how both mediating variables of attitude towards fintech and its perceived uncertainty lead to the behavioral intention to use credit cards in Kuwait (AlNajem, 2018). In the fintech context, behavioral intention is a strong decision-oriented proxy to see if financial technology is adopted (Lee, 2018). These variables incorporate the path impacts of both technology-centric independent variables, such as ease of use and ease of usefulness, as well as finance-centric independent variables, such as price value and perceived security of the transaction.

Figure 1 outlines the key pathways of the relationships between the factors affecting the acceptance of credit card use as a combination of technological and financial concerns. Two dominant factors of technology acceptance, namely Perceived Ease of Use (PEU) and Perceived Usefulness (PU), are assumed to affect the overall attitude (a) toward adopting the technology in financial transactions. Credit cards as financing activities have their own acceptance factors. The Perceived Cost (PC) and Perceived Risk (PR) in transactions lead to the Perceived Value (PV) of credit card usage. Both the technology acceptance attitude and the perceived value of the transaction are hypothesized to lead the Behaviour Intention (BI) to use credit cards. Figure 1 presents the hypotheses for these relationships.

Figure 1: Conceptual model for factors affecting the adoption of credit cards in Kuwait. This figure is the property of the author(s)



The following eight hypotheses are developed and discussed through the relevant literature thereafter.

2.8.1. Hypothesis 1: Perceived ease of use affect the attitude towards the adoption of credit cards in Kuwait

Perceived ease of use is a significant factor influencing consumers' attitudes towards credit card adoption. Studies conducted in various countries, such as Vietnam (Nguyen and Cassidy, 2018), Pakistan (Ali et al., 2017), and Malaysia (Ahmed et al., 2010), have demonstrated that perceived ease of use, perceived usefulness, and subjective norms impact consumers' intentions to adopt credit cards. Furthermore, perceived risk associated with credit card usage affects consumer attitudes. Studies have shown that risk perceptions influence consumer attitudes towards debits and credit card usage (Wang and Farquhar, 2018). Additionally, the availability of information and perceived complexity of credit cards can impact adoption rates (Jamshidi et al., 2014). Consumer attitudes towards credit cards are shaped by factors such as perceived usefulness, availability of information, and intention to use the card (Sriyalatha, 2016). Positive attitudes towards credit cards have been associated with increased usage (Xiao et al., 1995). Moreover, attitudes towards credit card usage have been found to impact consumers' actual usage of credit cards among consumers (Rasiah, 2013). In conclusion, perceived ease of use, perceived usefulness, subjective norms, and risk perceptions are crucial factors that influence consumers' attitudes towards credit card adoption. Understanding these factors can assist financial institutions and policymakers in Kuwait in tailoring strategies for promoting credit card adoption among consumers.

2.8.2. Hypothesis 2: Perceived usefulness affect the attitude towards adoption of credit cards in Kuwait

Perceived usefulness is a crucial factor influencing individuals' attitudes towards credit card adoption, as supported by various studies. For instance, Jamshidi and Hussin, (2016) highlighted the significance of perceived usefulness in influencing people's intention to use Islamic credit cards (Jamshidi and Hussin, 2016). Similarly, Davis (1989) found that perceived usefulness strongly impacts individuals' intentions, explaining that a substantial portion of the variance (Davis, 1989; Sriyalatha, 2016) emphasizes that perceived usefulness and the availability of information regarding credit cards are crucial factors influencing attitudes towards credit card usage (Sriyalatha, 2016). Additionally, Quan and Nam (2020) revealed that perceived usefulness positively affects credit card adoption among Vietnamese consumers (Quan and Nam, 2020). These studies collectively demonstrate that perceived usefulness significantly affects individuals' attitudes towards the adoption of credit cards, underscoring its importance in shaping consumer behavior in this context.

2.8.3. Hypothesis 3: E-financial literacy affect the attitude towards adoption of credit cards

Financial literacy is a key factor that influences individuals' attitudes towards credit card adoption. Research has demonstrated that financial literacy has a significant impact on financial behavior, including credit card usage (Allgood and Walstad, 2015). Furthermore, studies have shown that the number of credit cards owned can predict debt levels, independent of financial literacy and spending attitudes (Norvilitis et al., 2006). Attitudes towards credit card use are closely linked to spending habits, financial practices, and stress levels (Borden et al., 2007). Positive attitudes towards credit and favorable general attitudes towards credit usage have been associated with higher credit card balances and installment debts (Chien and DeVaney, 2001). This indicates that individuals with a strong grasp of financial concepts are more likely to demonstrate responsible credit card behavior. Additionally, societal attitudes towards debt have shifted, leading to an increase in the adoption of credit cards owing to changing perceptions (Kumar and Karlina, 2020). These findings emphasize the significance of financial literacy in shaping attitudes towards credit card adoption, highlighting the necessity of educational programs to improve financial knowledge and encourage responsible credit card use.

2.8.4. Hypothesis 4: E-financial literacy affects the perceived value of credit cards

Financial literacy significantly influences credit card use. Research has shown that individuals with higher financial literacy levels demonstrate more responsible credit card behaviors, including higher credit card repayment rates (Hamid and Loke, 2021), engaging in less costly credit card practices (Allgood and Walstad, 2015), and experiencing improved financial well-being through self-efficacy (Limbu and Sato, 2019). Moreover, financial literacy is associated with lower credit card interest rates and mortgage costs (Liu et al., 2023). This connection between financial literacy and credit card behavior is further supported by the positive impact of financial literacy on formal bank account holdings, participation in financial markets, participation in commercial insurance, participation in pension plans, and credit card ownership (Hu et al., 2019). Additionally, there is a positive relationship between financial literacy and demand for formal credit, including credit card usage (Murta and Gama, 2021). These findings underscore the importance of promoting financial education to enhance individuals' financial decision making and overall financial well-being.

2.8.5. Hypothesis 5: Price cost affect the perceived value in credit card based transactions in Kuwait

The perceived value of credit card transactions in Kuwait is influenced by various factors related to price perception. Adel et al. (2022) highlight the impact of price perception dimensions, such as price consciousness, sale proneness, and prestige sensitivity, on consumers' perceived value, which in turn affects their behavioral intentions (ElMelegy et al., 2022; Lee and Chen-Yu, 2018). This emphasizes the mediating role of price perception in the relationship between price discounts and consumers' perceptions of savings, quality, and value, particularly in online apparel products (ElMelegy et al., 2017). Moreover, Zielke and Komor (2020) point out that customers in developed countries perceive the benefits of using credit cards in high-price categories, indicating a link between price, convenience, and perceived value. Yoon-Seo and Lee (2023) delve into how the price structure of two-sided markets, such as the credit card industry, can impact transaction volume and market share, shedding light on the broader economic implications of pricing strategies. Considering these insights, it is evident that the pricing strategies, discounts, and perceived benefits associated with credit card transactions play a crucial role in shaping consumers' perceived value, which ultimately influences their decisions and behaviors in the context of credit card-based transactions in Kuwait.

2.8.6. Hypothesis 6: Perceived risk affect the perceived value in credit card based transactions in Kuwait

Perceived risk significantly influences consumer intentions and behaviors related to credit card transactions. Studies have consistently demonstrated that perceived risk negatively impacts the intention to use credit cards (Anastasia and Santoso, 2020; Dewi and Aksari, 2019). This negative effect arises from the uncertainty and anxiety associated with credit card transactions, particularly in new payment methods, such as contactless credit cards (Wang and Lin, 2019). Moreover, perceived financial cost is a crucial factor affecting customer intentions regarding credit card usage (Ali et al., 2017; Zoysa and Rathnayaka, 2022). Consumers evaluate the potential risks and costs associated with credit card transactions against perceived benefits and lifestyle factors such as convenience and social status (Dewi and Aksari, 2019; Zoysa & Rathnayaka, 2022). The significance of fraud-detection systems in credit card transactions underscores the ongoing efforts to mitigate the risks associated with fraudulent activities (Vlasselaer et al., 2015). The complex interplay among perceived risk, financial costs, lifestyle factors, and fraud detection mechanisms significantly shapes how consumers perceive the value of credit card transactions, ultimately influencing their willingness to engage in such transactions. This finding is supported by various studies conducted across different regions and contexts.

2.8.7. Hypothesis 7: Perceived value affect the attitude towards adoption of credit card in Kuwait

The adoption of credit cards in Kuwait is influenced by various factors related to perceived value. Studies on credit card adoption in different contexts have shown that perceived usefulness, perceived behavioral control, subjective norms, and availability of information regarding credit cards play significant roles in shaping individuals' attitudes towards credit card usage (Jamshidi and Hussin, 2016; Quan and Nam, 2020; Sriyalatha, 2016). Additionally, the perceived benefits of credit cards, such as meeting needs at a reasonable cost and being a good deal, can impact consumers' attitudes towards credit cards (Huang and Fitzpatrick, 2018; Liu et al., 2012). Furthermore, the relationship between attitude and credit card usage has been established, indicating a positive correlation between attitudes towards credit card use and actual credit card usage (Rasiah, 2013). Attitudes towards credit cards can be influenced by factors such as knowledge structures, beliefs, likes, dislikes, and psychographic characteristics (Ahmed et al., 2010). Moreover, perceived control of indebtedness with credit cards can positively influence individuals' intentions to incur personal debt using credit cards (Baño et al., 2020).

2.8.8. Hypothesis 8: Attitude towards adoption of credit cards affect the behavioural intention to use credit cards

The adoption of credit cards is influenced by various factors such as personality traits, financial knowledge, and attitudes towards credit card use (Norvilitis et al., 2006). Attitudes play a crucial role in determining the intention to use credit cards, which is defined as an individual's inclination to respond to an object or concept, thus affecting credit card usage (Jamshidi and Hussin, 2016). In economies such as Vietnam, consumers' intentions to adopt credit cards are influenced by perceived usefulness, ease of use, subjective norms, self-efficacy, and anxiety (Nguyen and Cassidy, 2018; Al Reshaid et al., 2024). Affective credit attitudes impact credit card purchasing behavior among specific demographic groups such as college students (Chien and DeVaney, 2001). The relationship between attitude and intention to select credit cards has been established, indicating a positive impact of attitude on intention to choose credit cards (Ali et al., 2017). Studies have shown that perceived behavioral control has a significant influence on the intention to use credit (Anastasia and Santoso, 2020). Perceived behavioral control has been reported as the most significant variable for predicting other financial services in Kuwait (Al-Shamali and Kashif, 2023). The literature emphasizes the importance of attitudes in shaping behavioral intentions towards the adoption of credit cards and their usage, highlighting the need to consider factors such as perceived risk, perceived security, and social influence in understanding consumer intentions to use credit cards (Zahrani, 2021).

2.8.9. Hypothesis 9: The perceived value affects the behavioural intention to use credit card

Perceived value is a critical factor that influences behavioral intention to use credit cards. Research indicates that perceived usefulness significantly impacts an individual's intention to use credit cards (Jamshidi and Hussin, 2016). Moreover, the perceived value of credit cards, encompassing benefits and involvement, is associated with the intention to use co-branded credit cards (Wang and Farquhar, 2018). Additionally, perceived risk and security related to credit card usage are key predictors of consumers' intentions to use credit cards (Zahrani, 2021). Furthermore, perceived control over indebtedness through credit cards positively affects the intention to engage in personal indebtedness (Baño et al., 2020). These findings underscore the significance of perceived value, usefulness, benefits, risk, and control in shaping individuals' intentions to use credit cards, highlighting the multifaceted nature of the factors influencing consumer behavior in the credit card domain.

3. METHODOLOGY

This study conducts a survey of financial technology users in Kuwait. Demographics were included to identify various variables in the adoption of fintech. The demographics included age, gender, education, and income level to determine whether these demographics made a difference to the relationships placed for evaluation. A total of 300 questionnaires were distributed, resulting in 276 fully filled questionnaires that were included in the study. The questionnaires were filled using an online platform, and the sampling size was decided based on the convention in research related to fintech adoption (Shaikh et al., 2020). The questionnaire was designed on a five-point Likert Scale with one indicating strongly disagree, whereas five indicates strongly disagree (Kaushik and Agrawal, 2021). The questionnaire was attached to the annexure.

This study utilized structural equation modelling using PLS SEM (Henseler et al., 2016) to measure the structure of the proposed model and seven associated hypotheses. Attitude, perceived value, and behavioral intention were measured through four items. Perceived Ease of Use and Perceived Usefulness were measured using five items each, whereas Perceived Cost and Perceived Risk were measured using three items each. These items were adapted from the relevant literature reviewed in this study (Cao, 2016; Huei et al., 2018; Susilo et al., 2019; Shaikh et al., 2020; Singh et al., 2020; Liao et al., 2022).

PLS SEM is a rigorous method used to explain the relationship between the observed and latent variables. PLS SEM is popular for evaluating the acceptance of technology generally and specifically for explaining the factors affecting the acceptance of financial technology (Cao, 2016). The SEM has shown particularly reliable results when the factors of technology acceptance, such as perceptions of use and usefulness, are combined with financial aspects such as the perception of security in financial transactions, for example, accepting Bitcoins (Lee, 2018).

3.1. Sample and Data Collection

The research employed a quantitative survey methodology to test the hypotheses and fulfil the objectives of the study. Data were gathered through self-administered questionnaires distributed to residents of Kuwait. The questionnaire was structured in two primary sections: the first collected demographic information including gender, age, marital status, educational attainment, occupation, and income; and the second, a structured survey assessing key constructs, with responses recorded on a five-point Likert scale from strongly disagree to strongly agree.

3.2. Data Analysis

This study employed PLS-SEM, which is a robust technique for analyzing complex models with multiple independent and dependent variables (Hair et al., 2014). This study investigated the relationships between the measured variables and latent constructs within a model comprising eight constructs, 22 hypotheses, 31 indicators, and two mediators. An initial descriptive analysis was conducted, followed by a two-step SEM analysis: a measurement model assessment and a structural model assessment. The former assessed construct reliability, convergent validity, and discriminant validity, whereas the latter explored structural relationships. Reliability was measured using Cronbach's alpha, convergent validity via AVE, and discriminant validity using cross-loadings, the Fornell and Larcker criterion, and HTMT. The study was conducted using SmartPLS 3 software (Ringle et al., 2015).

4. RESULTS

Demographic characteristics of the participants are presented in Table 1. Most participants in the study were from 20 to 30 age

group (62.1%), with a significant proportion being students. The gender distribution was nearly balanced, with females slightly outnumbering males, accounting for 51.9% of the participants. In terms of educational attainment, a significant majority held a bachelor's degree (60.0%), while post-graduates and those with only a high school diploma represented 11.8% and 25.9%, respectively. Regarding employment status, students formed the largest group at 58.6%, indicating a young, academically engaged cohort. Government and private sector employees comprised 15.3% and 18.7% of the sample, respectively, with 7.4% of businesspersons.

4.1. Reliability Analysis

The reliability index serves as a measure to assess the consistency of data, specifically evaluating the reliability of the measures for a particular construct. Cronbach's alpha, a statistical tool, is commonly used to determine the reliability of instruments or tests with values ranging from 0 to 1. Following the guidelines set by Cronbach (1951) and Nunnally and Bernstein (1994), a construct was considered reliable if its Cronbach's alpha value exceeded 0.7. The outcomes of this reliability assessment are documented in Table 2, which shows that no individual item's Cronbach's alpha exceeded the construct's overall Cronbach's alpha. It was also noted that all items, with the exception of PR1, had a Corrected Item-Total Correlation <0.30 (Saraç et al., 2023). Consequently, PR1 was removed from the dataset before further analysis.

Table 3 presents the correlations across the constructs. The constructs were significantly correlated with the BI output variable. The highest correlation of the output variable BI was found with PV (r_p = 0.68), whereas the lowest correlation was found with PR (r_p = 0.07).

4.2. Measurement Model Assessment

The measurement model, as depicted in Figure 2, illustrates how latent variables are assessed through corresponding indicators and the relationships between constructs via path coefficients along with R-square values (Hair et al., 2019). According to Hair et al. (2016), the measurement model describes how latent variables are quantified using associated indicators.

Table 1: Summary of demographic characteristics (This table is the property of the author [s])

Demographics	Overall (n=568) (%)
Age	
<20	101 (17.8)
20-30	353 (62.1)
31-40	54 (9.5)
41-50	31 (5.5)
51-60	21 (3.7)
More than 60	8 (1.4)
Gender	
Male	273 (48.1)
Female	295 (51.9)
Education	
Less than high school	13 (2.3)
High school diploma	147 (25.9)
Bachelor	341 (60.0)
Post-graduate	67 (11.8)
Job	
Student	333 (58.6)
Government employee	87 (15.3)
Private sector employee	106 (18.7)
Businessperson	42 (7.4)

The figure illustrates a conceptual model exploring the determinants of technology acceptance and user behavior intention, including Perceived Ease of Use (PEU), Perceived Usefulness (PU), E-Financial Literacy (EFL), Perceived Cost (PC), Perceived Risk (PR), Perceived Value (PV), attitude (ATE), and Behavioral Intention (BI). The model shows that both Perceived Ease of Use and Perceived Value positively influence attitude, which, in turn, strongly influences Behavioral Intention (R^2 = 0.617), suggesting that a user's positive attitude towards technology is crucial in predicting their intention to use it. Additionally, perceived cost and risk are significant factors that contribute to the Perceived Value of the technology, indirectly affecting user attitude and intention. The model underscores the complex interplay among ease of use, cost, risk, value, and user attitude in shaping technology acceptance behavior.

4.3. Outer Loadings and Convergent Validity

Outer loadings and convergent validity are metrics used in structural equation modeling to assess the quality of a measurement model. Outer loadings evaluate how well each indicator reflects its corresponding latent variable, with values ideally above 0.708 (Hair et al., 2018) indicating strong associations. Convergent validity was assessed through three key statistics: Cronbach's Alpha and Composite Reliability (both measure internal consistency and should be above 0.708 and 0.70, respectively), and Average Variance Extracted (AVE), which gauges how much variance in the indicators is captured by the construct versus due to measurement error, with values above 0.50 considered adequate (Hair et al., 2019). These metrics ensure the reliability and accuracy of the constructs measured in this study. In this study, the values of Cronbach's Alpha, Composite Reliability and AVE exceeded the threshold value, thus confirming the convergent validity of the construct (Table 4).

4.4. Discriminant Validity

Discriminant validity is a statistical measure used to determine the extent to which distinct constructs differ from one another within a given study. This ensures that each construct is empirically unique and not merely a reflection of the other variables within the measurement model. According to Hair et al. (2019), discriminant validity is achieved when the variance shared by a construct with its indicators is greater than the variance shared with any other construct in the model.

This study utilized three criteria to examine discriminant validity. Two prevalent methods for assessing discriminant validity are cross-loading and the Fornell-Larcker criterion. According to Hair et al. (2016), the cross-loading method requires that an indicator's loading on its own construct be higher than its loadings on any other construct. Table 5 shows the results of cross-loading, confirming the discriminant validity of the constructs.

The Fornell and Larcker (1981) criterion, further elaborated by Grégoire and Fisher (2006) and Ringle et al. (2010), involves comparing the square root of each construct's Average Variance

Extracted (AVE) with its bivariate correlations with other constructs. Discriminant validity was confirmed if the square root of the AVE for any given construct was higher than its correlation with other constructs. Table 6 shows the results of the Fornell-Larcker criterion, which confirmed the discriminant validity of the constructs.

Although traditionally used, methods such as cross-loadings and the Fornell-Larcker criterion have been deemed insufficiently sensitive for confirming discriminant validity. In response, Henseler et al. (2015) introduced a more sensitive measure known as the heterotrait–monotrait ratio of correlations (HTMT). This ratio was calculated by comparing the average correlations among the indicators across different constructs to those within the same construct. To confirm the discriminant validity, the HTMT value between any two constructs should be <0.85. The results of the HTMT ratio, shown in Table 7, reveal that the HTMT between all constructs was <0.85, thus confirming the discriminant validity of the constructs.

Table 2: Item reliability statistics (This table is the property of the author [s])

Items	Mean	SD	Item-rest correlation	If item dropped Cronbach's α
ATE1	3.43	1.055	0.6005	0.941
ATE2	3.48	1.039	0.6028	0.941
ATE3	3.48	1.092	0.6462	0.941
ATE4	3.59	1.114	0.6976	0.940
BI1	3.67	1.089	0.6918	0.941
BI2	3.66	1.051	0.6855	0.941
BI3	3.63	1.062	0.6829	0.941
BI4	3.62	1.146	0.6505	0.941
PEU1	3.73	1.111	0.6611	0.941
PEU2	3.77	1.001	0.6938	0.941
PEU3	3.83	0.999	0.7185	0.940
PEU4	3.91	0.999	0.6796	0.941
PEU5	3.82	1.008	0.7141	0.940
EFL1	3.45	1.096	0.5303	0.942
EFL2	3.33	1.069	0.5392	0.942
EFL3	3.49	1.090	0.4535	0.943
EFL4	3.61	1.076	0.5338	0.942
EFL5	3.56	1.041	0.5555	0.942
PC1	3.20	1.039	0.2522	0.945
PC2	3.40	0.992	0.4915	0.942
PC3	3.30	1.013	0.5318	0.942
PR1[a]	3.18	1.129	−0.0218	0.947
PR2	3.12	1.099	0.1889	0.945
PR3	3.25	1.091	0.1997	0.945
PU1	3.60	0.937	0.6394	0.941
PU2	3.67	0.943	0.6105	0.941
PU3	3.65	0.975	0.6039	0.941
PU4	3.61	0.990	0.5910	0.942
PU5	3.65	0.970	0.5963	0.942
PV1	3.50	1.033	0.6979	0.941
PV2	3.48	1.014	0.6435	0.941
PV3	3.53	0.982	0.6744	0.941
PV4	3.65	1.011	0.7002	0.941

[a]Reverse scaled item, overall cronbach's α = 0.943

4.5. Structural Model Assessment

Following validation of the measurement model, the subsequent phase involved developing the structural model. To assess the relevance and significance of each hypothesis, a bootstrapping technique was employed. In line with Roldán and Sánchez-Franco, (2012), the study used t-test and a 95% confidence interval (CI) to establish the statistical significance of the hypotheses, as outlined by Hair et al. (2017).

The study's results, as presented in Table 8, highlight the statistical significance of the various hypothesized relationships. The finding shows that Attitude (ATE) had a positive and significant effect on Behavioral Intention (BI) ($\beta = 0.523$, $t = 12.420$, $P < 0.001$). The influence of E-Financial Literacy (EFL) on attitude ($\beta = 0.079$, $t = 1.998$, $P = 0.046$) and Perceived Value (PV) ($\beta = 0.250$, $t = 5.403$, $P < 0.001$) were also supported, suggesting a positive impact of EFL on these constructs. Perceived Ease of Use (PEU) significantly affected attitude ($\beta = 0.316$, $t = 6.633$, $P < 0.001$), reinforcing its importance in shaping positive perceptions.

The relationships between Perceived Cost (PC) and Perceived Risk (PR) and Perceived Value were also significant, with coefficients of 0.475 ($t = 11.274$, $P < 0.001$) and 0.087 ($t = 2.207$, $P = 0.027$), respectively, demonstrating their contributory roles in evaluating the value of the service or product. However, the effect of Perceived Usefulness (PU) on attitude is not supported ($\beta = -0.014$, $t = 0.324$, $P = 0.746$), indicating that PU may not influence attitude. Furthermore, the impact of Perceived Value on both attitude ($\beta = 0.433$, $t = 8.995$, $P < 0.001$) and Behavioral Intention ($\beta = 0.338$, $t = 7.570$, $P < 0.001$) was significant, confirming the critical role of Perceived Value in shaping both the attitudinal and behavioral intentions of individuals.

In this study, the mediating roles of attitude (ATE) and Perceived Value (PV) were explored between the exogenous and endogenous variables. Table 9 presents the outcomes of the mediation analysis.

The mediation analysis results demonstrated the significant indirect effects of various constructs through mediators in the proposed model. E-Financial Literacy (EFL) shows an indirect effect on

Table 3: Correlation analysis (This table is the property of the author [s])

	ATE		BI		PEU		EFL		PC		PR		PU		PV
ATE	—														
BI	0.732	***	—												
PEU	0.608	***	0.597	***	—										
EFL	0.419	***	0.365	***	0.520	***	—								
PC	0.411	***	0.474	***	0.444	***	0.357	***	—						
PR	0.071		0.069		0.016		0.098	*	0.124	**	—				
PU	0.430	***	0.421	***	0.528	***	0.441	***	0.345	***	0.242	***	—		
PV	0.648	***	0.678	***	0.608	***	0.425	***	0.580	***	0.089	*	0.577	***	—

*P<0.05, **P<0.01, ***P<0.001

Table 4: Outer model summary table for the PLS-PM model (This table is the property of the author [s])

Construct	Items	Loading	VIF	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
ATE	ATE1	0.827	2.411	0.856	0.862	0.902	0.696
	ATE2	0.829	2.391				
	ATE3	0.859	2.198				
	ATE4	0.822	1.850				
BI	BI1	0.877	2.456	0.901	0.902	0.931	0.772
	BI2	0.883	2.778				
	BI3	0.898	3.032				
	BI4	0.855	2.291				
EFL	EFL1	0.823	2.113	0.860	0.864	0.899	0.642
	EFL2	0.823	2.047				
	EFL3	0.795	2.010				
	EFL4	0.751	1.610				
	EFL5	0.811	1.883				
PC	PC2	0.913	1.860	0.809	0.811	0.913	0.840
	PC3	0.920	1.860				
PEU	PEU1	0.838	2.324	0.908	0.909	0.931	0.730
	PEU2	0.857	2.533				
	PEU3	0.882	2.865				
	PEU4	0.856	2.588				
	PEU5	0.839	2.287				
PR	PR2	0.947	2.027	0.832	0.890	0.921	0.853
	PR3	0.899	2.027				
PU	PU1	0.799	1.879	0.901	0.902	0.926	0.716
	PU2	0.865	2.623				
	PU3	0.860	2.479				
	PU4	0.866	3.040				
	PU5	0.838	2.550				
PV	PV1	0.832	1.940	0.867	0.868	0.909	0.715
	PV2	0.847	2.224				
	PV3	0.865	2.330				
	PV4	0.839	1.963				

Figure 2: Node diagram for the PLS-PM model with loading and path estimates. This figure is the property of the author(s)

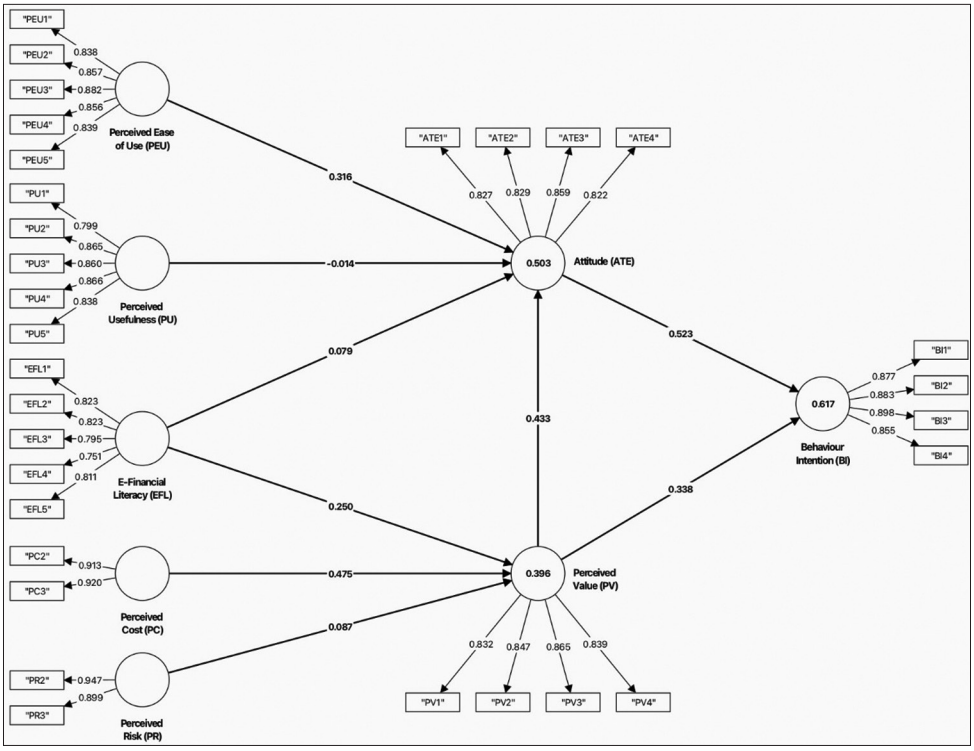


Table 5: Loadings and cross loadings for the model (This table is the property of the author [s])

Items	ATE	BI	EFL	PC	PEU	PR	PU	PV
ATE1	**0.827**	0.524	0.348	0.273	0.500	0.143	0.348	0.511
ATE2	**0.829**	0.534	0.358	0.281	0.501	0.089	0.369	0.486
ATE3	**0.859**	0.648	0.328	0.377	0.495	0.115	0.332	0.560
ATE4	**0.822**	0.737	0.377	0.448	0.542	0.093	0.391	0.598
BI1	0.683	**0.877**	0.358	0.399	0.533	0.069	0.369	0.628
BI2	0.641	**0.883**	0.347	0.412	0.510	0.136	0.378	0.594
BI3	0.659	**0.898**	0.339	0.430	0.529	0.157	0.340	0.583
BI4	0.624	**0.855**	0.267	0.428	0.524	0.153	0.360	0.575
EFL1	0.323	0.312	**0.823**	0.270	0.431	0.065	0.384	0.339
EFL2	0.362	0.313	**0.823**	0.314	0.363	0.138	0.332	0.387
EFL3	0.291	0.250	**0.795**	0.290	0.333	0.072	0.324	0.268
EFL4	0.344	0.321	**0.751**	0.279	0.477	0.046	0.378	0.347
EFL5	0.365	0.295	**0.811**	0.303	0.470	0.047	0.372	0.364
PC2	0.365	0.415	0.329	**0.913**	0.385	0.110	0.321	0.518
PC3	0.407	0.454	0.339	**0.920**	0.443	0.126	0.306	0.540
PEU1	0.499	0.485	0.460	0.387	**0.838**	0.073	0.420	0.478
PEU2	0.517	0.503	0.463	0.397	**0.857**	0.082	0.457	0.501
PEU3	0.562	0.524	0.434	0.390	**0.882**	0.117	0.469	0.560
PEU4	0.510	0.511	0.420	0.345	**0.856**	0.076	0.467	0.490
PEU5	0.527	0.524	0.452	0.413	**0.839**	0.068	0.460	0.561
PR2	0.150	0.147	0.082	0.141	0.092	**0.947**	0.235	0.179
PR3	0.082	0.119	0.091	0.091	0.090	**0.899**	0.269	0.131
PU1	0.395	0.377	0.373	0.269	0.487	0.217	**0.799**	0.483
PU2	0.361	0.349	0.383	0.300	0.443	0.270	**0.865**	0.486
PU3	0.380	0.357	0.342	0.297	0.435	0.214	**0.860**	0.491
PU4	0.321	0.314	0.399	0.301	0.454	0.214	**0.866**	0.451
PU5	0.359	0.336	0.399	0.279	0.425	0.221	**0.838**	0.453
PV1	0.534	0.568	0.380	0.512	0.525	0.139	0.545	**0.832**
PV2	0.519	0.549	0.336	0.439	0.487	0.139	0.428	**0.847**
PV3	0.570	0.584	0.347	0.493	0.491	0.187	0.450	**0.865**
PV4	0.576	0.590	0.392	0.505	0.549	0.114	0.472	**0.839**

The bold values in the table represent the loadings of each indicator on its corresponding latent construct. A loading is considered acceptable when it is higher on its assigned construct than on any other construct, indicating discriminant validity. In this table, all indicators exhibit higher loadings on their intended constructs (highlighted in bold) than on the others, supporting the distinctiveness of the constructs in the model.

Table 6: Fornell-Larcker criterion results (This table is the property of the author [s])

Constructs	ATE	BI	EFL	PEU	PC	PR	PU	PV
ATE	0.834							
BI	0.743	0.879						
EFL	0.424	0.374	0.801					
PEU	0.613	0.596	0.521	0.855				
PC	0.422	0.475	0.364	0.452	0.916			
PR	0.131	0.145	0.093	0.098	0.129	0.924		
PU	0.432	0.412	0.448	0.532	0.342	0.269	0.846	
PV	0.651	0.678	0.431	0.607	0.577	0.171	0.561	0.846

Behavioral Intention (BI) through Attitude (ATE) ($\beta = 0.041$, $t = 1.985$, $P < 0.05$). Perceived Ease of Use (PEU) significantly impacted the BI mediated by ATE ($\beta = 0.165$, $t = 5.656$, $P < 0.001$). However, the indirect effect of Perceived Usefulness (PU) through ATE on BI was not statistically significant ($\beta = -0.007$, $t = 0.324$, $P = 0.746$). Further, a significant mediating effect of PV was observed between EFL and ATE ($\beta = 0.108$, $t = 4.951$, $P < 0.001$), EFL and BI ($\beta = 0.084$, $t = 4.515$, $P < 0.001$), PC and ATE ($\beta = 0.205$, $t = 6.742$, $P < 0.001$), PC and BI ($\beta = 0.160$, $t = 6.016$, $P < 0.001$), PR and ATE ($\beta = 0.037$, $t = 2.106$, $P = 0.035$) and PR and BI ($\beta = 0.029$, $t = 2.146$, $P = 0.032$). Additionally, the combined mediating effects of PV and ATE on EFL and BI ($\beta = 0.056$, $t = 4.502$, $P < 0.001$), PR and BI ($\beta = 0.020$, $t = 2.031$, $P = 0.042$), and PC and BI ($\beta = 0.107$, $t = 5.734$, $P < 0.001$) were also significant.

5. DISCUSSION

5.1. Credit Card Usage among Youth

This study evaluated multiple causal paths for the determinants of credit card acceptance among youth in Kuwait. With the modernization of payment support systems, credit card acceptance is not only convenient but also a financing facility. Financial technology has facilitated the use of credit cards because it provides a wider locale for its use by youth, particularly as they are native to the technology in Kuwait. Credit cards as a facility provide easy access to online shopping and digital payments, but at the same time bring associated problems such as managing credit and more impulse buying online. In this context, this study has multiple implications for the Kuwaiti context and beyond.

5.2. Credit Card Usage from the Kuwaiti Context

This study produced evidence to support the hypotheses stated in Kuwait's context. Along with the conventional notion of credit cards' perceived ease of use and perceived usefulness, it has been found that customers take into consideration the perceived cost, their e-financial literacy, and the risk associated with the credit cards. These findings match other contextual research, where risks and costs are taken as important considerations for using e-financial services in Kuwait (Chavali and Kumar, 2018). This is largely because perceived value mediates the relationship between these determinants and the actual intention to use credit cards. However, the rationale for adopting e-financial services is established in the literature (Putri et al., 2022).

5.3. Findings from the Conceptual Framework

This study built a framework using a generic Technology Acceptance Model (TAM). Primarily, TAM focuses on the perceived ease of

Table 7: HTMT ration results (This table is the property of the author [s])

Constructs	ATE	BI	EFL	PEU	PC	PR	PU	PV
ATE								
BI	0.832							
EFL	0.488	0.421						
PEU	0.692	0.659	0.587					
PC	0.495	0.556	0.435	0.527				
PR	0.150	0.167	0.110	0.112	0.153			
PU	0.488	0.455	0.508	0.587	0.401	0.314		
PV	0.748	0.765	0.492	0.682	0.687	0.197	0.631	

Table 8: Bootstrap results for the inner model regression paths (This table is the property of the author [s])

Hypothesis	Original sample (O)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P-values	Decision
ATE -> BI	0.523	0.042	12.420	0.000	Supported
EFL-> ATE	0.079	0.039	1.998	0.046	Supported
EFL-> PV	0.250	0.046	5.403	0.000	Supported
PEU-> ATE	0.316	0.048	6.633	0.000	Supported
PC-> PV	0.475	0.042	11.274	0.000	Supported
PR-> PV	0.087	0.039	2.207	0.027	Supported
PU-> ATE	−0.014	0.042	0.324	0.746	Not Supported
PV -> ATE	0.433	0.048	8.995	0.000	Supported
PV -> BI	0.338	0.045	7.570	0.000	Supported

Table 9: Bootstrap results for the inner model regression paths (Mediation analysis) (This table is the property of the author [s])

Hypothesis	Original sample (O)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P-values	Decision
EFL-> ATE -> BI	0.041	0.021	1.985	0.047	Supported
PEU-> ATE -> BI	0.165	0.029	5.656	0.000	Supported
PU-> ATE -> BI	−0.007	0.022	0.324	0.746	Not Supported
PV -> ATE -> BI	0.226	0.032	7.000	0.000	Supported
EFL-> PV -> ATE -> BI	0.056	0.013	4.502	0.000	Supported
PR-> PV -> ATE -> BI	0.020	0.010	2.031	0.042	Supported
PC-> PV -> ATE -> BI	0.107	0.019	5.734	0.000	Supported
EFL-> PV -> ATE	0.108	0.022	4.951	0.000	Supported
EFL-> PV -> BI	0.084	0.019	4.515	0.000	Supported
PC-> PV -> ATE	0.205	0.030	6.742	0.000	Supported
PC-> PV -> BI	0.160	0.027	6.016	0.000	Supported
PR-> PV -> ATE	0.037	0.018	2.106	0.035	Supported
PR-> PV -> BI	0.029	0.014	2.146	0.032	Supported

use, usefulness, attitude, and consequent behavioral intention to use, as used for the adoption of financial technology. (Lee, 2018; Liao et al., 2022; Shaikh et al., 2020; Singh et al., 2020; Susilo et al., 2019). This study confirmed these relationships, except that no sufficient evidence is found for attitude as a mediator for perceived usefulness and behavioral intention. This may be because usefulness is more utility-centric and may therefore have more pragmatic value for reaching credit card adoption rather than forming an attitude first. The study also includes multiple variables related to financial technology, such as perceived cost, perceived risk, and e-financial literacy. These factors were found to have a significant impact on behavioral intention to use credit cards. In these relationships, e-financial literacy plays a central mediating role in actualizing the adoption of credit cards in Kuwait.

5.4. Financial Literacy

E-financial literacy is crucial for adoption and requires a special focus in future research. Financial literacy has multiple contributions to the overall adoption of financial technology in general, and credit cards in particular. Therefore, the promotion of literacy about financial technology and its adoption go hand in hand (Mohamad and Kassim, 2019). Individuals with higher digital financial literacy are more likely to understand financial technology and therefore adopt financial technology more rationally. This literacy may come in both finance and technology, either separately or as a whole. The finance aspects require knowledge of financial flows and the inter-play between cost, return, and risk, as they create a full realm of financial management in terms of developing an overall psychology of using credit cards (Trinh et al., 2020), where the focus is on credit. The technological aspects of fintech, on the other hand, require a greater focus on the technological literacy of users, so that they can realize operational benefits and avoid inconvenience in adopting and using credit cards.

5.5. Digital Literacy in Relation to Credit Card Usage

The digital literacy of credit cards requires more attention to the details of how credit card technology works, as it involves a complex financing or loaning process, as well as technology. Therefore, users may need to understand how customer data are used and how they can be abused. This aspect is particularly important in maintaining a credible history of continuing benefits from credit cards. The use of credit cards requires digital literacy to manage this form of modern money (Hamid and Loke, 2021). Although this study provides important technological and financial factors for its adoption in Kuwait, more attention is required to understand the implications in the post-adoption context. For example, credit cards promote impulse buying and accelerate consumption, as technology provides easy access to spending, and may therefore cause an increase in expenses for users. Digital literacy related to credit cards can help users be more rational in their spending decisions.

5.6. Credit Card Usage in relation to New Kuwait Plan (Kuwait 2035) and SDGs

Credit cards are core consumer financing instruments that enable financial inclusion and help consumers to have ready access to documented consumption. Both financial inclusion and documentation of consumer markets are important for the realization of Kuwait's Vision 2035, where digitalization of the economy is an important construct (Alkharafi and Alsabah, 2025; Olver-Ellis, 2020; Alrashidi et al., 2022), which similar to the approach Qatar has taken to reach its vision (El-Dabt et al., 2025). The adoption of credit cards as a financial inclusion instrument

can also help Kuwait achieve multiple sustainable development goals (SDGs). Access to finance through credit cards can help individuals improve their overall well-being and help Kuwait in wealth distribution, as the saver's money may go to those who have deficits in saving through credit channels. These points are in line with SDG 10, which is related to reduced economic inequalities. Furthermore, the availability of credit for consumption can accelerate economic productivity because it can facilitate a higher demand for products. Moreover, credit cards enable consumers to have efficient financial access, contributing smoothly to production and growth. This line of thought is associated with SDG 8, which focuses on economic growth. However, one may wonder that since credit cards provide easy access to finance, they may also promote impulsive consumption, which may lead to unnecessary consumption, which contradicts responsible consumption aimed at SDG 12. Digital literacy is, therefore, important in the sense that users must be fully informed of both the positive and negative consequences of using credit cards so that it can be used for the overall betterment of all parties involved in the economy.

6. CONCLUSION

This study empirically evaluated the adoption of credit cards in Kuwait. This study has both theoretical and empirical implications because it incorporates both the technological and financial factors of credit card adoption. This collective stance makes this study unique in terms of how credit cards are perceived from both technological and financial perspectives. This study strongly recommends the enhancement of both digital and financial literacy to make users more informed, thus helping them make more informed choices in relation to credit card usage. This is important because the use of digitally enabled financial instruments, such as credit cards, has multiple implications for Kuwait's vision for 2035. Credit cards have important implications for the economy because credit and digitalization are core to the transactional regime. Further, the adoption of credit cards has both positive and negative implications for development goals. On the one hand, it can increase financial inclusion and economic groups through users' access to finance; on the other hand, easy access to finance may promote impulse consumption, thus hindering responsible consumption.

This study has two main limitations that provide a basis for future research. This study focuses on the adoption of credit cards as financial technology in Kuwait. Therefore, this study has limited analytical and regional generalizability (AlBuloushi et al., 2024). Other regions may have different aspects of credit cards and technologies. Consequently, the readers are suggested that cautious generalizations be made. Second, the data were self-reported by users of credit cards in Kuwait. There are chances of having impacts of social desirability and biased self-assessment by the respondents. Therefore, the study's findings can be read with secondary market data on the use of credit cards in Kuwait. Both provide a holistic understanding of credit card adoption in Kuwait.

The behavioral data collected in this study can be crossed with longitudinal market research to determine the extent to which they match. This will not only triangulate the findings but will also combine both the empirical and behavioral aspects of the credit card market; thus, collective and more pragmatic implications can be generated. Furthermore, the findings from credit cards as an established financial technology can provide a basis for studying the acceptance of other forms and modes of payment in Kuwait. For example, cryptocurrency and credit cards together create a new market; thus, this study can be extended to explore this phenomenon further. In future studies, multiple financial technologies and regions can be studied to see how variations in financial technology occur across regions and across the continuum of technological innovation.

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