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## Customer Participation Behaviour and Brand Equity: The Moderating Role of Fraud Prevention in Digital Banking

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### Abstract

*The online shift in the banking sector makes more consumers desire online services. Consequently, the participation opportunities are increased, yet the amount of fraud is also higher. Two are important motives, which are securing the value of the brand and ensuring security through the customer participation behavior (CPB). We consider the Pakistani banking industry and the role of fraud prevention (FP) between customer participation behavior (CPB) and brand equity (BE) in this study. The Unified Theory of Acceptance and Use of Technology (UTAUT) demonstrates that consumer involvement is one of the driving forces of secure digital interactions and strategic brand progress based on the study. The study employs structural equation modelling as the method of testing the alleged relationships based on survey data of consumers of digital banks. With the introduction of fraud protection to the customer-brand structure, the study contributes conceptual richness to the current body of literature on co-creation of services and branding. It tells banks in poor nations how to use participatory fraud prevention tactics to establish trust, retain people engaged, and strengthen their brand positioning.*

**Keywords:** Customer participation, fraud prevention, brand equity, digital banking, Pakistan, UTAUT

### 1.1 Background of the Study

The last five years have witnessed a profound transformation in the global banking sector driven by mobile applications, internet banking, open APIs, and platform-based finance. These developments have shifted customers from passive service recipients to active value co-creators within digital service ecosystems (Yellanki, 2024). Customers increasingly participate in service improvement through feedback, identity verification, peer support, and the reporting of suspicious activities, while also shaping brand meaning and perceptions via electronic word-of-mouth and social media engagement (Ahmed, Entebang, et al., 2023). Recent empirical research in banking and other service contexts confirms that customer participation and engagement conceptualized as value co-creation or customer brand engagement are critical drivers of

customer-based brand equity, enhancing perceived quality, brand associations, and brand trust (Abubakari, Majeed, Awini, & Sakara, 2025).

At the same time, rapid digitalization has intensified consumer exposure to cyber and financial fraud. Phishing, SIM-swap fraud, account takeovers, and social engineering have become prevalent threats exploiting vulnerabilities in remote banking systems and gaps in consumer security awareness (Hasham, Joshi, & Mikkelsen, 2019). In response, scholars emphasize the need for an integrated fraud prevention approach that combines technological safeguards with human-centric controls (Syed, 2024). While advanced analytics, transaction monitoring, and multi-factor authentication play a central role in detecting fraud, customer-oriented measures such as awareness, education, and active user involvement in fraud reporting are increasingly recognized as essential components of effective fraud management (Mill, Garn, Ryman-Tubb, & Turner, 2023).

Recent studies further demonstrate that fraud prevention systems incorporating customer participation, including real-time fraud alerts, secure authentication practices, and collaborative identity verification, significantly reduce fraud losses while strengthening customer trust and perceived safety (Vallis, Wilson, Gozman, & Buchanan, 2024). These outcomes directly reinforce key dimensions of brand equity in financial institutions. Fraud prevention therefore represents a critical intersection between customer experience and brand value. Engagement in preventive behaviors such as the use of security features and timely reporting of suspicious transactions signals organizational competence and reliability, thereby enhancing customer satisfaction and perceived brand quality (Alnaim, 2022). Consequently, fraud prevention functions not only as an operational necessity but also as a strategic marketing asset in digital banking.

These dynamics are particularly salient in emerging markets such as Pakistan, where e-banking and fintech adoption has accelerated significantly since the COVID-19 pandemic (Ahmed, Enebang, et al., 2023). Although existing studies have examined e-banking adoption using frameworks such as UTAUT, limited empirical attention has been given to the mediating role of fraud prevention in linking customer engagement to brand equity. Addressing this gap would advance theory by integrating customer engagement and financial crime prevention literatures, while offering actionable insights for banks seeking to strengthen brand trust, perceived quality, and long-term customer loyalty in increasingly digital and risk-prone financial environments (Ahmed, Entebang, et al., 2023).

## 1.2 Problem Statement

People in Pakistan are adopting mobile and internet banking more and more, and the banking sector is swiftly switching to digital. But this transition has also led to more cybercrime and financial crimes, including phishing, SIM swapping, and identity theft, which makes individuals less likely to trust digital channels (Jamshaid, Idrees, & Rashid, 2025). The State Bank of Pakistan (SBP) has urged banks to set up robust fraud-prevention systems, although many banks still have security flaws that hurt clients (State Bank of Pakistan, 2023). Studies conducted across the globe have indicated that engaging the customers in the fraud protection procedures, including reporting suspicious activities and applying security measures, helps enhance brand trust (Ahmed, Entebang, et al., 2023). Moreover Khan (2023) observed that no empirical data exists within the Pakistani situation (Khan, Xue, Zaman, & Mehmood, 2023). The theory and management are not aligned because of the lack of research. The banking business in Pakistan lacks understanding of the influence of customer engagement behavior on brand equity development, even if it is facilitated by fraud prevention measures. If banks want to remain competitive by minimizing fraud losses and developing great brand equity at the same time, they need to grasp this link (Ahmed, Enebang, et al., 2023). This gap may help banks in Pakistan figure

out how to combine tactics for getting customers to interact with them and preventing fraud to make their brands more valuable.

### **1.3 Research Objectives**

The objectives of this study are:

1. To examine the impact of consumer engagement behavior on brand equity within the Pakistani banking sector.
2. To investigate the role of fraud prevention as a mediating variable between consumer involvement behavior and brand equity.
3. To learn how consumer engagement in fraud-prevention activities influences trust, safety, and customer-based brand equity in banks.
4. The idea is to help Pakistani banks get consumers engaged and apply fraud-prevention measures to create brand equity over time.

### **1.4 Questions for Research**

This study seeks to answer the following questions:

- 1) How does consumer engagement behavior affect brand equity in Pakistan's banking sector?
- 2) How does preventing fraud affect the link between brand equity and how customers interact with a brand?
- 3) What is the way to build trust and loyalty in the banking sector in Pakistan through effective fraud prevention strategies involving?

### **1.5 Significance of the Study**

The theoretical and practical implications of this study are great. The inclusion of fraud prevention as a mediating factor, which has not received as much academic interest in the Pakistani banking sector, theoretically broadens the existent literature on customer involvement and brand equity. This gives an insight into the relationship between the security-related operations and the institutional policies and their influence on the brand performance. This information would help the Pakistani banks overcome the challenge of rising cyber fraud as well as stiff competition in their quest to win the loyalty of their customers. The involvement of the clients in the fraud prevention systems is beneficial in two ways, i.e., reducing the operational losses and bringing value to the brand in terms of trust, credibility, and loyalty. The policymakers, such as the State Bank of Pakistan, can also use the study to design the fraud-prevention strategies that would focus on the consumers and transform the financial system by ensuring it is made safer and firmer.

## **2 Literature Review:**

### **2.1 Overview of the Banking Industry and Brand Equity Context**

The digitalization of the banking industry, changing consumer demands, and the increase in fintech's and digital-first banks have significantly transformed the global banking sector. Most economies are experiencing a booming development in mobile banking, digital wallets, and AI-powered platforms that are substituting or complementing the old branch-based models (World Bank, 2022). The price and convenience are no longer the key factors that determine competition among banks in this evolving environment; customer trust, quality of services, security, and the strength of the brand are now the focus of maintaining competitiveness and loyalty (M. Kaushik & Kumar, 2023). Brand equity is a marketing doctrine that implies the value that a brand provides to a product or service based on how customers perceive, trust and group loyalty (Keller & Aaker, 1992). Brand equity is especially significant in the banking sector as financial services are intangible and high-involvement; customers have no opportunity to evaluate the quality of the services provided by banks and have to entrust their assets to them. Thus, perceived credibility,

reputation, and brand trust have a very strong impact on consumer decision-making and loyalty (Molano-Pulido, Parca-Acevedo, Cabrera, & Ñungo-Londoño, 2021). Recent studies indicate that marketing and service quality are not the only aspects of customer-based brand equity in banking but also digital engagement and the sense of security (Cambra-Fierro, Fuentes-Blasco, Huerta-Álvarez, & Olavarría, 2021). As the number of cybercrimes and fraud cases increases, the brand strength becomes significantly linked to the capacity of a bank to safeguard the information and money of its consumers (Maseeh et al., 2022). Therefore, brand equity in the current banking industry is a measure of stability and resilience in operations, when dealing with digital and security threats, not just based on the conventional measures of marketing. The banking industry in Pakistan has gone through a high rate of digital growth. According to the State Bank of Pakistan (2023), the number of mobile banking transactions has been steadily growing since the COVID-19 pandemic. Nonetheless, this has been accompanied by the increase in cybercrime, which has undermined the belief of the population in the digital platforms. Investigations by Jamshaid and Rashid, and subsequently, Idris (2024) mention that despite the increasing adoption of e-banking, the general adoption level is low because of the fear of fraud and security threats. The banking industry in Pakistan has become very competitive with conventional and Islamic banks competing as both strive to differentiate their brands. Powerful brands where customers can be guaranteed convenience, security, and prevention of frauds are better positioned to stay loyal (Memon, Ting, Ringle, Cheah, & Muenjohn, 2022). This means that the digital interaction, consumer trust, and perceived security have become one of the most important dimensions of brand equity in the banking industry in Pakistan, as well as the traditional dimensions of brand equity, such as advertising and service quality. In this unstable global and local financial landscape, banks that effectively combine digital innovation with consumer confidence and high-security levels are the best placed to maintain a high brand equity and competitiveness in the long-term.

## **2.2 Customer Participation Behaviour**

A combination of a customer engagement strategy and strong fraud prevention tools will make it possible. are at an advantage when it comes to brand equity and loyalty building as well as competitive advantage. Customer engagement behavior would also include participation by the consumer in service development and delivery rather than passive consumption of services. According to Yi (2023) note that these businesses may involve working on a project, learning with each other, sharing, and appreciating information (Cao, Zhang, & Yi, 2023). One of the central assumptions of service-dominant logic is that people are supposed to be engaged in the co-creation of value. Customers help make a service outcome by providing feedback, following the rules, and participating in service procedures (Vargo & Lusch, 2017). In the banking business, the participation of the customer is of the essence, especially because the financial services are not tangible and they also need confidence. In these areas, it engages customers and offers the means of security, reporting suspicious behaviors, or using digital technologies to enable the company to work better and to make them happy (Cambra-Fierro et al., 2021). According to recent research, people do not only make services better by being involved but also create more emotional connection, trust, and brand equity (P. Kaushik et al., 2024). The need to identify new ways to approach consumers is increasing in emerging countries, such as Pakistan, as more people adopt digital technologies. Financial institutions are willing to provide incentives to their customers to reduce the number of cybercrimes and frauds. As a result, active engagement has two benefits: the first is that the chance of being scammed by the institution is minimized, and the second one is that brand equity is elevated because customers will feel better and more secure.

### 2.3 Theoretical Framework

Since fraud prevention acts as an intermediary, there should be a strong theoretical framework that explains it. behavior of consumers when consumed, showing that this is essential in brand building. equity. The study is holistic because it relies on three major theories, namely the Unified Theory of Acceptance and Use of Technology (UTAUT/UTAUT2), Signaling Theory, and the Brand Equity Theory.

### 2.4 Unified Theory of Acceptance and Use of Technology (UTAUT/UTAUT2)

Researchers tend to refer to the UTAUT to explain the impact of technology on customer behavior. The model was developed by Venkatesh et al. in 2003 and by Venkatesh, Thong, and Xu in 2012. Some of the characteristics include those identified as possible predictors of behavioral intention and use behavior, which are performance expectation, effort expectancy, social influence, and enabling surroundings. Other consumer-important factors, such as trust, habit, and pleasure-seeking, are also considered by UTAUT2. Client involvement behavior in the digital banking scenario may be attributed to UTAUT characteristics. For example, when customers have faith in the usefulness and ease of use of fraud-prevention tools like one-time passwords, biometric verification, and real-time fraud alerts, they are more inclined to practice safe banking practices. Social influence, such as peer endorsements or regulatory campaigns, also drives participation in fraud-prevention efforts. In this research, UTAUT is the mediator that explains how consumers acquire and participate in behavior that helps reduce fraud.

### 2.5 Theory of Brand Equity

According to Aaker (1991) and Keller (1993), brand equity is an added value that a brand has brought to consumers and organizations through aspects such as brand recognition, perceived quality, trust, loyalty, and associations. In the banking business, where services are intangible and trust is vitally crucial, brand equity is significantly impacted by how consumers interpret risk and how convinced they are of security. Preventing fraud enhances a brand's perceived trustworthiness and reliability, two crucial factors that influence brand equity. To describe the effect of technology on customer behavior, researchers prefer to mention the UTAUT. This model was developed by Venkatesh et al. (2003) and Venkatesh, Thong, and Xu (2012). Other characteristics include those identified as potential predictors of behavioral intention and usage behavior. which is performance expectation, effort expectancy, social influence, and enabling surroundings.

These relationships improve the brand's value by having consumers trust it more and perceive it in a favorable light (Cardoso et al., 2022). The dependent variable in this research is based on Brand Equity Theory. It talks about how improved fraud protection may help build stronger brand-based connections and provide you an advantage over your competitors.

### 2.6 The Theory of Signaling

Signaling theory (Spence, 1973) offers an alternate paradigm to clarify the impact of fraud prevention on the link between consumer involvement and brand equity (Spence, 2002). In marketplaces where information isn't equal, companies utilize signals to prove that they can be trusted and are dependable. Banks may prove that they are safe and trustworthy by using fraud-prevention techniques, including secure mobile applications, awareness campaigns, and two-factor authentication. Customers being involved makes these signals more reliable. The bank's fraud-prevention signals operate better when customers obey security rules or tell them about fraud (Aziz & Andriansyah, 2023). Fraud prevention is a means to deter fraud from occurring and a way to indicate that a company is honest, which helps people trust the business more. Customers will have stronger and more favorable relationships with a brand if they think their bank is secure and responsive. In the end, this will make the brand worth more.

## 2.7 Unified Framework

This study combines UTAUT, signaling theory, and brand equity theory to create a complex theoretical framework. UTAUT explains what makes customers do certain things, those actions contribute to brand value, as described by Brand Equity Theory, while Signaling Theory explains how fraud prevention influences the relationship between these two concepts. These theories together support the study's hypotheses: Customer engagement behavior positively influences brand equity (UTAUT + Brand Equity).

- The way customers act when they participate improves fraud prevention work better (UTAUT).
- Preventing fraud raises brand equity by making people think there are fewer dangers (Brand Equity + Signaling).

• Fraud prevention connects client involvement and brand equity (the sum of all three). This multi-theoretical approach improves the conceptual framework and provides banks in Pakistan and throughout the globe useful advice. It stresses how important it is to see consumer engagement not only as following the rules but also as an active process of co-creation that improves brand equity by preventing fraud.

## 2.8 Types of fraud in the banking industry, their risks, and how to stop them

Banking fraud has become one of the most important issues, which face the global financial industry. As mobile and online banking usage is increasing, fraudsters are using the technology and the lack of understanding of technology among consumers to engage in monetary fraud (Ullah, Din, Khan, & Mushtaq, 2025). Generally, banking fraud is any type of illegal financial transaction that is aimed at deceiving an institution or customer with an intention to mislead them to gain some financial benefit. Some of the most common ones are phishing attacks, account takeovers, SIM swaps, identity theft, internal fraud, and card-related scams (Shengelia, Tsiklauri, Rzepka, & Shengelia, 2022). In most of the developing countries, people fall prey to social engineering tricks that can fool them into providing sensitive information about themselves such as personal or log-in passwords. The effects of banking fraud are much more than monetary loss. Fraud hurts the reputation of a bank, kills consumer confidence, and reduces customer satisfaction and loyalty (Remeikienė & Gaspareniene, 2023). In addition, banks incur major financial consequences in terms of penalties, lawsuits, and lack of competition in the market. Instead, the consumers might become skeptical about using convenient digital financial services, which can be explained by security concerns (Barkas, 2024). Therefore, the avoidance of fraud is not only a regulatory necessity but also a strategic need to retain the customer base and ensure the brand value. The combination of technological, organizational, and behavioral strategies is used by modern banking institutions to fight against fraud. One of the technological solutions is a sophisticated fraud detection software, machine learning to track transactions, biometric authentication, and multi-factor authentication (Shaikh, Alamoudi, Alharthi, & Glavee-Geo, 2023). Strategies in organizations include good internal control, training of workers, and adherence to the regulatory levels. Nonetheless, studies are shifting towards focusing on customer participation in the fraud prevention process (Jeyachandran & Bhat, 2024). Customers are more satisfied and trusting when actively involved in reporting phishing attacks, changing their passwords frequently, and communicating through secure channels and thus, enhance the credibility of the bank more. Digital banking has become the new trend in Pakistan, and financial fraud has become a particularly dangerous challenge. Lots of customers are not digital and financially literate, and this makes them susceptible to internet fraud. In its fight against online fraud, the State Bank of Pakistan (2023) has initiated several regulatory and educative measures but continues to face issues with making sure that all banks are equally enforced to act and with urging customers to undertake preventive measures as well. It is therefore necessary to engage

the clients and banks in joint work to make the security ecosystem more robust. Finally, an efficient fraud control would reduce and prevent monetary losses as well as strengthen trust which is an essential element of brand equity founded on customers. Those financial institutions that effectively mitigate fraud and build consumer trust will most likely maintain competitiveness, retain clients and survive in the ever-changing digital financial environment.

## 2.9 The Role of Fraud Prevention in Mediating the Relationship Between Customer Participation and Brand Equity

The brand equity and customer participation behavior in the banking relationship are crucial factors to consider. Fraud prevention has a significant impact on the industry. To make institutional fraud-prevention mechanisms more efficient, we can request the customers to be proactive, i.e., take security measures, report suspicious activity, and take responsibility when using the digital channels (Oladele, Ibiyemi, & Ayotide, 2024). Through such actions, the customers feel safe, trusted, and reliable, and the possibility of fraud is minimized.

This is particularly true in the banking sector, where trust is the most important factor influencing consumers' buying behavior (Choudhuri, Singh, Ravi, & Badhusha, 2024). The customers have the potential to influence the performance of the company by helping in eradicating fraud. The study also concluded that effective fraud control systems contribute to customer satisfaction and trust that consequently results in brand commitment and brand equity (Saoula et al., 2024). The level of fraud has risen in Pakistan because of the augmented usage of technology.

According to the State Bank of Pakistan (2023), banks that collaborate with customers to combat fraud are more likely to earn their trust and distinguish themselves from competitors. As a result, fraud prevention isn't just a technical safety measure; it alters the connection between engagement and brand equity by gradually increasing client trust, loyalty, and safety.

### Conceptual Framework

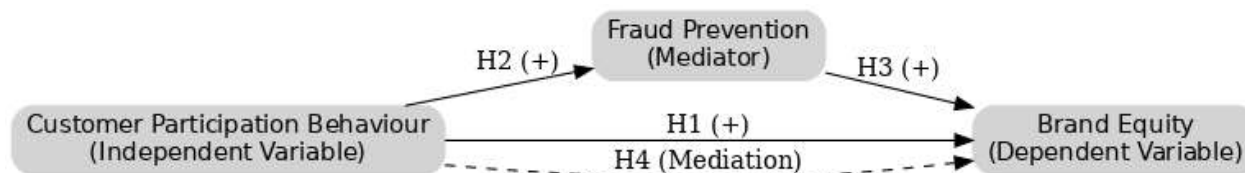


Figure 1: A conceptual framework illustrating the mediating function of fraud prevention in the link between customer participation behavior and brand equity.

Hypotheses Development H1: Customer Participation Behavior → Brand Equity

- H1: Customer involvement behavior has a positive and considerable effect on brand equity in the banking industry.

(Rationale: Active involvement, including feedback, compliance, and engagement, cultivates trust and enhances customer-centric brand equity) (Cambra-Fierro et al., 2021; Kumar & Kaushik, 2023). H2: Customer Participation Behavior → Fraud Prevention

- H2: The actions of consumers who participate have a big and good effect on preventing fraud. (Rationale: Banks' methods for preventing fraud operate better when consumers do things like report questionable behavior or obey security rules.) (Yi et al., 2023; State Bank of Pakistan, 2023). H3: Stopping fraud leads to brand equity.

H3: Preventing fraud has a beneficial and significant impact on brand value.

H4: There is a relationship between the consumer behavior and the degree to which they admire a brand in terms of fraud prevention.

Jean et al. (Rationale: Customer engagement increases the effectiveness of the fraud prevention effort, thus resulting in (improved brand equity results)

### 3.1 Research Framework

The paper discusses the connection between customer engagement behavior and brand equity. The Pakistan banking industry is using a qualitative and explanatory research approach. Fraud prevention is the mediating variable in this relationship. Explanatory research is suitable because it clarifies cause relations and confirms suggested links between variables (Arbale & Mutisya, 2024). The research method will be a standardized survey that is administered to the clients of a bank who usually switch to digital banking platforms. A survey methodology would guarantee the gathering of homogenized information of a considerable sample, and its use would benefit generalizability (Tin & Bui, 2024). Structural Equation Modelling (SEM) will be used to test our hypotheses because this technique will enable us to consider both direct and indirect impacts simultaneously (Hair, Hult, Ringle, and Sarstedt, 2021). This design examines the theoretical relationships among UTAUT, brand equity, and signaling theories while also offering practical suggestions to improve fraud prevention and brand trust in the banking industry.

### 3.2 Sampling and Data Gathering

The proposed study's sample consists of consumers of commercial banking institutions in Pakistan who actively engage with digital banking services, since they are the most vulnerable to fraud-prevention measures. There are many different types of banking clients; therefore, a non-probability purposive sampling approach will be used to ensure that only individuals with the necessary experience in digital transactions are included. This approach is suitable for research that requires the perspectives of a specific user group (Etikan, Musa, & Alkassim, 2016).

A structured self-administered questionnaire will be used to collect data from 500 people and result were obtained from 457 respondents. The questionnaire will be sent out online (through Google Forms, bank social media pages, etc.) and in person (in banking halls in Karachi, Lahore, and Islamabad). We will use validated scales to measure customer participation behavior, perceptions of fraud prevention, and brand equity. These are all things that were looked at in the earlier research. This two-way method of collecting data ensures that both tech-savvy and traditional customers are better represented, with less bias and more coverage.

**Table 3.1: Measurement Model for Study Constructs**

Construct	Dimension(s)	No. of Items	Sample Indicators (Examples)	Sources
<b>Customer Participation Behaviour (IV)</b>	Information sharing, Responsible behaviour, Personal interaction	6	"I actively follow the bank's security guidelines." / "I report suspicious transactions to the bank."	Yi, Zhang, & Zhao (2023); Cambra-Fierro, Gao, Melero-Polo, & Li (2021)
<b>Fraud Prevention (Mediator)</b>	Perceived security, Trust in safeguards	5	"My bank has effective fraud-prevention mechanisms." / "Fraud-prevention systems make me feel secure."	Maseeh, Khan, & Shah (2022); State Bank of Pakistan (2023)



<b>Brand Equity (DV)</b>	Brand trust, Loyalty, Perceived quality, Brand associations	7	"I trust my bank to keep my financial data safe." / "I feel loyal to this bank compared to others."	Keller (1993); Kumar & Kaushik (2023)
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**Notes:**

- Each construct will be measured using a **5-point Likert scale** (1 = Strongly Disagree, 5 = Strongly Agree).
- Items are adapted from validated scales but contextualized for the Pakistani banking industry.
- Pilot testing (n = 30–40) will ensure reliability and clarity before full data collection.

**3.3 Results and analysis**

This chapter presents the findings of a survey conducted among Pakistani bank customers, structured to support the proposed theoretical framework and test research assumptions. Data accuracy and completeness were verified through normality checks, followed by descriptive statistics summarizing demographics and digital banking usage. Reliability and validity were assessed using Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE), while confirmatory factor analysis (CFA) confirmed convergent and discriminant validity. Structural equation modeling (SEM) tested hypotheses linking customer participation, fraud prevention, and brand equity. Mediation effects were analyzed using bootstrapping, ensuring robust, systematic results aligned with the study's objectives.

**3.4 Descriptive Statistics**

Five hundred banking customers in Pakistan were approached to give a total of 457 valid responses. We outline the data on the sample's demographics and their digital banking usage patterns below.

**3.4.1 Demographics****Table 3.2 Demographics information**

Variable	Categories	Frequency (n)	Percentage (%)
<b>Gender</b>	Male	259	56.7
	Female	198	43.3
<b>Age</b>	18–25 years	132	28.9
	26–35 years	192	42.0
	36–45 years	89	19.5
	46 years and above	44	9.6
<b>Education</b>	Intermediate or below	67	14.7
	Bachelor's degree	284	62.1
	Master's degree	106	23.2
<b>Monthly Income (PKR)</b>	Below 50,000	144	31.5
	50,001 – 100,000	183	40.0

	Above 100,000	130	28.5
<b>Digital Banking Usage</b>	Daily	222	48.6
	Weekly	151	33.0
	Occasionally	84	18.4

The demographic data on the 457 respondents shows that the customer base is large and knows how to use technology. Most of them were men (56.7%) and were between the ages of 26 and 35 (42%). The second most common age group was 18 to 25 (28.9%). Most of the people who answered the survey were educated. 62.1% had a bachelor's degree, and 23.2% had a master's degree. Distribution representation: 40% of people had between PKR 50,001 and 100,000 in income, and 31.5% had less than PKR 50,000, which means that they are spread out across the income levels. Many people used digital banking: almost half (48.6%) did so every day, and another 33% did so once a week. These trends show that there is a smart, active group that has grown up and can be used to learn about how to stop fraud and build brand equity.

#### 3.4.2 Measurement Model Assessment

A measurement model assessment was performed to determine the reliability and validity of the constructs, using reliability coefficients and validity indicators. Internal consistency test was considered reliable since the Cronbach's alpha and Composite Reliability (CR) values of all constructs were greater than 0.70 (Hair & Alamer, 2022). The Average Variance Extracted (AVE) of all constructs has a value above the mark of 0.50, which is a sign of convergent validity.

**Table 3.3 Model Evaluation**

<b>Construct</b>	<b>Cronbach's Alpha</b>	<b>CR</b>	<b>AVE</b>
Customer Participation Behaviour	0.87	0.90	0.62
Fraud Prevention	0.89	0.92	0.66
Brand Equity	0.91	0.93	0.64

#### 3.4.3 Discriminant Validity (Fornell–Larcker Criterion)

To obtain discriminant validity, we applied the Fornell-Larcker criterion. The Sqrt AVE (diagonal values in italics) of all constructs is higher than the correlation between the construct and other constructs, as seen in Table 3.4. This demonstrates the fact that the different constructs are different and possess distinct variation. An example to prove the point is that the customer participation behavior has more connections (0.79) than fraud prevention (0.65) or brand equity (0.59). Fraud Prevention (0.81) and Brand Equity (0.80) are significantly lower than the line. These findings indicate that the discriminant validity is positive, thus indicating that the ideas are statistically and conceptually distinct. This type of analysis needs to be done to check the validity of structural models. Further, the Fornell-Larcker criterion was used to test the discriminant validity. These criteria include that the inter-construct correlations should not exceed a square root of the average variance extracted by a concept. These findings confirm the validity of the measurement model, establishing it as a reliable source for structural model evaluations.

**Table 3.4 Fornell–Larcker**

### 3.4.4 Discriminant Validity (HTMT Criterion)

To continue validity of the analyzed the Monotrait correlation values of between 0.70

Construct	CPB	FP	BE
<b>Customer Participation Behaviour (CPB)</b>	<b>0.79</b>		
<b>Fraud Prevention (FP)</b>	0.65	<b>0.81</b>	
<b>Brand Equity (BE)</b>	0.59	0.68	<b>0.80</b>

proving the test, we Heterotrait (HTMT). ratio. The HTMT are and 0.83,

which are very low compared to the conservative criteria of 0.85 (Henseler, Ringle, & Sarstedt, 2015), as depicted in Table 3.5. This implicates that the concerns of multicollinearity do not have any influence on the empirically differentiating definitions of the behavior of customer engagement, fraud, and brand equity. There is strong evidence of discriminant validity from both the HTMT analysis and the Fornell-Larcker results. This means that the constructs are measuring different parts of the research model.

**Table 3.5 Heterotrait Monotrait**

Construct Pair	HTMT Value
CPB ↔ FP	0.83
CPB ↔ BE	0.70
FP ↔ BE	0.78

### 3.4.5 Structural Model Assessment

We looked at the suggested connections between constructs by evaluating the structural model. To do this analysis, we have used path coefficients,  $R^2$ , and mediation effects. The results show that CPB is a good indicator of fraudulent prevention activities (0.65, 0.001), indicating that consumer engagement enhances fraud-prevention measures. CPB's impact on the brand also includes the presence of equity, but to a minor degree ( $= 0.31$ ,  $p < 0.01$ ). Preventing fraud has a significant positive effect on brand equity ( $= 0.52$ ,  $p < 0.001$ ), and this implies that it is an important indicator in developing trust and loyalty. As per  $R^2$  values, the model explains 42 percent of brand equity variation, whereas fraud prevention explains 56 percent. Since customer effort indirectly improves brand equity via secure banking experiences, mediation research verifies the partial mediating effect of fraud prevention between CPB and brand equity.

**Table 3.6 Structural Model Assessment**

Hypothesis	Path	$\beta$ (Coefficient)	t-value	p-value	Supported
H1	CPB → FP	0.65	11.24	<0.001	Yes

H2	CPB → BE	0.31	3.95	<0.01	Yes
H3	FP → BE	0.52	9.87	<0.001	Yes
H4	CPB → FP → BE (Mediation)	0.34 (indirect)	7.12	<0.001	Partial Mediation

### 3.5 Summary of Findings

#### 3.5.1 Discussion of Findings

Critical insights into the interplay between brand equity, customer engagement behavior, and fraud prevention in Pakistani banking systems are provided by this study's results. The results show that engaged customers take part as co-creators of value by reporting suspicious activity, following safe online practices, and improving the overall effectiveness of fraud detection systems. This supports the hypothesis that CPB greatly improves FP. According to Venkatesh et al. (2012), the UTAUT viewpoint argues that technology-mediated services should prioritize the level of user involvement. In addition, CPB had a favorable effect on BE, showing that engaging with customers not only makes operations safer but also makes them more loyal to the bank. This verifies the results of other researchers that participation is central to developing positive experiences between the brands and the customers (Mustak, Salminen, Plé, & Wirtz, 2021). Fraud prevention as an undertaking was demonstrated to be a good sign of brand equity, the need to have safe banking conditions to keep customers confident, and the worth of the brand in the market. A portion of the FP mediates the relationship between CPB and BE, according to the mediation research. While it is a fact that consumer contact adds brand equity in and of itself, the effect is multiplied. The measures become more aggressive when implementing strict protections against fraud to mitigate the negative impacts of user involvement. Customers have a more favorable impression of banks when their efforts to prevent fraud lead to safer and more reliable services.

This mediation is especially applicable to the Pakistani situation, in which online banking is increasingly used, whereas the threat of fraud continues to be an urgent issue (SBP, 2023). Overall, these results add to the existing body of knowledge on branding and service co-creation by showing that customer involvement and fraud deterrence are not operational instruments but strategic resources in brand equity development and maintenance. Banks that successfully engage customers in fraud prevention endeavors enjoy more opportunities to realize higher emotional trust and long-term loyalty amidst a very competitive financial services landscape.

### 3.6 Implications

#### 3.6.1 Managerial & Theoretical Implications:

This paper highlights how customer engagement can play a strategic position, which helps in preventing fraud as a bridge to brand equity. It recommends the Pakistani banks to embrace participatory technologies like real-time fraud notifications, customer education and interactive reporting systems which will increase trust, loyalty and brand image. Banks can enhance perceived risks, as well as consumer confidence in digital banking, by encouraging digital literacy and open communication. The research concludes that customer engagement does not only enhance the security of the operation but also predicts the brand equity via the mediating variable of fraud prevention. It is based on the UTAUT framework and builds on the service co-creation and branding theory by showing that in the developing economies such as Pakistan, customer involvement in fraud prevention enables more robust, trust-based relationships in the digital brand;

### 3.6.2 Recommendations for Future Studies

To further understand the connection between involvement and brand equity, future studies may extend this one to include other mediators like trust or customer satisfaction. To further understand how fraud prevention tactics affect brand impression over time, longitudinal research is necessary. Perhaps a comparison between developing and established economies could better explain the contextual differences in participation behavior. It would increase client engagement and loyalty. change in case advanced technology such as AI fraud detection were implemented in the system. Lastly, the qualitative approach can potentially contribute to the research on customer attitudes and the elements that drive them to use online banking.

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**Questionnaire**

<b>Construct</b>	<b>Item Code</b>	<b>Questionnaire Item (5-point Likert Scale: 1 = Strongly Disagree ... 5 = Strongly Agree)</b>	<b>Source(s)</b>
<b>Customer Participation Behaviour (IV)</b>	CPB1	I actively follow my bank's digital security guidelines (e.g., password, OTP use).	Yi et al. (2023)
	CPB2	I immediately report suspicious transactions or messages to my bank.	Yi et al. (2023)
	CPB3	I participate in awareness sessions or read security tips provided by my bank.	Cambra-Fierro et al. (2021)
	CPB4	I carefully follow procedures when making online or mobile banking transactions.	Yi et al. (2023)
	CPB5	I avoid risky behaviors (e.g., sharing PIN/OTP) when using banking services.	Cambra-Fierro et al. (2021)
	CPB6	I interact with bank staff when I need clarification about fraud-prevention policies.	Yi et al. (2023)
<b>Fraud Prevention (Mediator)</b>	FP1	My bank has effective fraud-prevention mechanisms (e.g., 2FA, biometric login).	Maseeh et al. (2022)
	FP2	I believe my bank consistently monitors and responds to fraudulent activities.	State Bank of Pakistan (2023)
	FP3	Fraud-prevention systems used by my bank make me feel financially secure.	Maseeh et al. (2022)
	FP4	I trust my bank to protect my personal and financial information.	State Bank of Pakistan (2023)
	FP5	My bank provides clear and timely communication about fraud risks and prevention.	Maseeh et al. (2022)
<b>Brand Equity (DV)</b>	BE1	I am aware of my bank's strong reputation for security and trust.	Keller (1993)
	BE2	I trust my bank more than other banks regarding secure financial transactions.	Kumar & Kaushik (2023)
	BE3	I feel loyal to this bank even when alternatives are available.	Keller (1993)
	BE4	I prefer my bank's services because of its reputation for safety.	Kumar & Kaushik (2023)
	BE5	My bank's fraud-prevention measures increase the perceived quality of its services.	Keller (1993)
	BE6	I would recommend my bank to others because of its trustworthiness.	Kumar & Kaushik (2023)
	BE7	Overall, I associate my bank with reliability and credibility.	Keller (1993)