Minnesota Journal of Business Law and Entrepreneurship

Volume 2026, No. 1

ISSN: 1540-3270

Analysing the Intention towards Adoption of E-Banking among the Rural Population of India: The Moderating Role of Post-Pandemic COVID-19 Experiences

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Abstract

The current research explores the factors determining the introduction of e-banking among the Indian rural population, integrating both TPB and TAM models with the post-pandemic COVID-19 situation as a moderating variable. EFA, CFA, and SEM were used to analyse the data of 518 customers of the rural banks. Findings indicate that Trust is one of the strongest determinants of e-banking adoption, which is mediated by Perceived Usefulness and Ease of Use, and negatively mediated by Perceived Risk. The Trust-Attitude relationship was strengthened by post-pandemic conditions, which signify the increasing trust in digital banking. Despite being restricted to the rural regions, the research can be highly informative to banks, policymakers, and government programs to encourage the use of e-banking in rural regions.

Keywords: TPB, TAM, E-banking, Rural customers, and Post-pandemic COVID-19 situations.

1. Introduction

The world is gradually emerging from the fear of the COVID-19 pandemic, and it has brought many enduring changes in people's lifestyles. The pandemic has dramatically impacted many things in our lives; it may be our

food habits, working culture, way of shopping, or way of doing financial transactions. So, pandemic situations in some way or another forced us to adapt to these changes to survive. The COVID-19 catastrophe has engulfed the whole world, including all its subsets. For some industries, it was a nightmare, while for others, it was a 'once-in-a-lifetime' opportunity. For the banking industry, this was an opportunity to expand its business digitally through e-banking services. E-banking is a modern concept that facilitates the electronic access of banking services through the internet via mobile phones or laptops. The most important feature of e-banking is that it can operate electronically without any exchange of tangible commodities (Jindal & Sharma, 2020). In a pandemic experience, the requirement to maintain physical distance and the intangibility feature of e-banking have increased the adoption of e-banking to unexpected levels (Ashish M. Shaji, 2020).

The Indian banking industry has made a huge effort to reach remote locations and provide banking services with a finger click. In India, the subsequent occurrences of demonetization in 2016 and the COVID-19 pandemic in 2020 have sped up digitalisation to a considerable extent. A cashless economy, which was previously considered an alternative for development, has become a necessity. The COVID-19 pandemic has pushed the banking industry to emerge as a new digital banking industry as everyone is moving toward digital platforms and digital payments (Pandey et al., 2021). It also brought first-time digital payment users to this platform. However, many people are reluctant to use e-banking services, sometimes because of an aversion to technology or ignorance (Gogova et al., 2021).

According to a survey report from the Internet and Mobile Association of India (IAMAI-Kantar, 2021), the number of digital transactions has increased over the past two years. As compared to 2019, the digital services users in India rose by more than 51%, however, among rural people, the adoption of digital services penetration is still low (Brandwagon, 2022).

It has been a long-standing concern of government agencies and financial institutions to penetrate e-banking in rural areas, which is in dearth. This is evident in one report released by 'Kantar ICUBE 2020' on "Internet Adoption in India" that digital payments, including e-banking, have gained more popularity in urban areas, but issues still persist in rural areas in terms of awareness, accessibility, and infrastructure facilities (Kantar, 2021). Thus, it is relevant and a pressing issue to address the potential of e-banking services to improve financial inclusion and access to financial services for rural populations in India.

A growing body of literature in the field of e-banking services specifies many important factors which affect its acceptance or adoption among the banking customers. Raza et al. (2017) identified a notable correlation between resistance, perceived risk, compatibility, awareness, perceived ease of use, perceived usefulness, attitude, and intention to adopt mobile banking. Likewise, Nguyen et al. (2021) and Ly and Ly (2022) found significance in factors such as perceived usefulness, trust, social influence, and perceived ease of use in the adoption of e-banking among individuals.

It is worth noting that extensive research has already been conducted on Internet banking adoption both in India and internationally (Raza et al., 2015; Raza et al., 2019; Mostafa, 2020; Jindal and Sharma, 2020; Verma and Tanwar, 2022); however, a significant gap remains in understanding rural India's perspective, despite over 65% of the population residing in rural areas (World Bank, 2018). This gap becomes even more evident in the context of the post-pandemic COVID-19 situation, which has accelerated e-banking adoption (Nguyen et al., 2021; Chowdhury et al., 2022; Verma and Tanwar, 2022). There is still a considerable lack of understanding regarding the factors that influence the adoption of electronic banking among rural consumers, especially in the aftermath of the COVID-19 pandemic. To address this, the current research employs an integrated framework that combines the Technology Acceptance Model (TAM) and the Theory of Planned Behaviour (TPB), both of which are well-recognised for their effectiveness in explaining digital banking usage (Glavee-Geo et al., 2017; Singh & Srivastava, 2018; Singh & Malik, 2019; Anouze & Alamro, 2019; Ha, 2020; Obaid, 2021; Aldammagh, 2021; Wang et al., 2021). Additionally, this study incorporates the post-COVID-19 context as a moderating factor to better understand the changing attitudes and behaviours of rural users towards e-banking. In line with this framework, the study aims to address the following research questions:

RQ1: How do the different factors (PU, PEU, Trust, SN, and PR) influence the e-banking adoption among the rural population of India?

RQ2: How does the post-pandemic COVID-19 situations moderate the relationship between the identified factors and e-banking adoption in rural India?

RQ3: To what extent does the integration of the two models (TPB-TAM) enhance the understanding of the factors affecting rural customers' behaviour towards e-banking adoption?

The next sections of the article provide an overview of the literature relevant to the adoption of e-banking services with the proposed conceptual models and hypotheses. The subsequent section focuses on research methodology and data analysis. Finally, the paper ends with a discussion, implementation and conclusion.

2. Literature Review and Proposed Hypotheses:

The increasing penetration of the internet and digital technologies has prompted scholars to investigate consumer acceptance of electronic banking services. Numerous studies have examined the drivers influencing the adoption of e-banking in the context of rapid digital transformation globally (Glavee-Geo et al., 2017; Raza et al., 2019; Mostafa, 2020; Raza et al., 2020; Nguyen et al., 2021; Chowdhury et al., 2022). Electronic banking specifically aims to provide accessible and affordable financial services to traditionally underserved or cut-off populations in the formal financial framework (Shankar et al., 2020). The Government of India has realised its significance, and several policy actions and strategic initiatives have been launched to enhance the e-banking uptake further, as a part of its overall vision of digital transformation in the country (Mahapatra & Patra, 2018).

Adoption of technology is often termed as the acceptance and further use of an innovation (Robertson, 1971). TAM and TPB, the two popular models, have been widely implemented in a range of previous research topics in the field of behavioural psychology, social psychology, and the adoption of information systems (Anouze and Alamro, 2019; Ha, 2020; Obaid, 2021; Aldammagh, 2021; Wang et al., 2021).

2.1. Integration of Models: TAM and TPB

The TAM proposed by Davis (1989) and the TPB proposed by Ajzen (1991) are widely utilised to understand users' behaviour in adopting new technologies such as electronic banking. TAM focuses on technological factors, while TPB considers personal factors to explain individual behaviour towards innovative technology adoption (Glavee-Geo et al., 2017; Singh & Srivastava, 2018; Anouze and Alamro, 2019). Combining these models provides a more comprehensive understanding of technology adoption in e-banking. For example, a study conducted by Anouze and Alamro (2019) in Jordan showed that integrating TPB and TAM offered a stronger explanation of electronic banking adoption than using either model alone. Similar findings were reported by Glavee-Geo (2017) in Pakistan and Singh and Srivastava (2018) in India, regarding electronic banking or mobile banking adoption. A recent study by Aldammagh et al. (2021) and Wang et al. (2021) employed integrated TAM-TPB models to explore factors influencing customers' intentions to adopt mobile banking and payment services, respectively. They identified PU, PEU, and Trust as key determinants.

2.2. PU and PEU in E-Banking Services

PU is an important parameter for technology acceptance, as it enhances the efficiency and speed of a job (Jerene et al., 2019), while PEU is frequently viewed as one's subjective perception towards a system or technology as being easy to understand, learn, and use (Abramson et al., 2015).

Various recent studies in the field of consumer behaviour and technology adoption confirm that both factors play a crucial role in understanding the attitude and intention of customers towards e-banking adoption. For example, the study conducted by Andrea et al. (2021) found that both PU and PEU significantly influenced customers' attitude and intention to adopt e-banking services in Indonesia. Similar studies have been undertaken by many researchers, such as Tavera-Mesias et al. (2022) on the adoption of mobile banking services; Alsmadi et al. (2023) on the adoption of fintech-based e-banking services; and Verma and Tanwar (2022) on e-banking adoption during

the COVID-19 pandemic. It is worth noting that in all the studies, PU and PEU emerge as important cardinal factors in explaining the customers' attitude and intention toward e-banking adoption (Abdullah and Ward, 2016; Rafique et al., 2020). Thus, based on the preceding assertion, hypotheses H1 and H2 are proposed.

H1: PU significantly influences attitude towards e-banking adoption.

H2: PEU significantly influences attitude towards e-banking adoption.

2.3. Trust in E-Banking Services

Garbarino and Johnson (1999) defined Trust as 'customer confidence in the quality and reliability of the services offered.' Over the last decade, trust has gained much attention in research on consumer behaviour and information systems (Shankar et al., 2019). Users' trust gradually builds with time and experience. If a user frequently uses a system, they develop a sense of trust in it (McKnight et al., 2020).

E-banking customers are engaged in online operation of banking transactions and do not have face-to-face interaction with bank employees. Therefore, building strong trust among customers may minimise the perceived risk towards e-banking service providers (Shankar & Jebarajakirthy, 2019; Aldammagh et al., 2021; Wang et al., 2021; Abed & Islam, 2022). Nevertheless, trust is an important antecedent that builds loyal and long-lasting customers and serves as a foundation pillar for building a good relationship between the service provider and customer (Shankar et al., 2019; Raza et al., 2020).

Thus, trust remains a critical factor in customer behaviour and information systems research, with a particular focus on its importance in e-banking. Based on the preceding arguments, hypothesis H3 is proposed.

H3: Trust significantly influences attitude towards e-banking adoption.

2.4. Social Norms (SN) in E-Banking Services

According to Ajzen (1991), social norms are described as "The perceived social pressure to perform or not to perform the behaviour". The TPB model regards social norms as a key factor for understanding customer attitudes and intentions (Ajzen and Fishbein, 1975). This refers to the pressure or coercion that an individual feels to follow their social surroundings (Daragmeh et al., 2021). Individuals' social environments mainly consist of peer groups, colleagues, family, and friends, who play a crucial role in determining whether they use e-banking or not (Shneor and Munim, 2019; Aldammagh et al., 2021). Existing research consistently shows that social norms strongly influence individuals' willingness to adopt e-banking. Numerous empirical studies have predicted a significant and positive relationship between social influence and the adoption of new technologies, such as e-banking (Hossain et al., 2020; Mer and Virdi, 2021). In light of the above discussion, hypothesis H4 is proposed:

H4: SN significantly influences attitude toward e-banking adoption.

2.5. Perceived Risk (PR) in E-Banking Services

Perceived risk pertains to the potential for adverse effects (Bauer, 1960). It can also be understood as the assessment of the costs involved in striving to achieve particular goals (Cox and Rich, 1964). To understand why people adopt technology in the context of online banking, Yousafzai et al. (2010) examine various models. TAM (Davis, 1989) and TPB (Ajzen, 1991) are regarded as the most suitable frameworks for explaining individuals' behaviour towards new technology adoption. Both the TPB and TAM theories implicitly link risk perception with trust in a technology's usefulness in improving a user's job efficiency. Perceived risk has been extensively examined across different domains, such as e-Healthcare, cashless payment systems, e-banking, and M-banking (Mulia et al., 2021; Namahoot and Jantasri, 2022). Technological advancement is the primary driving force behind adoption. Technology has evolved swiftly, leading to significant changes (Szeles and Simionescu, 2020). Several studies in India have also integrated perceived risk into the TAM to better understand e-banking adoption among banking customers. Based on these observations, we propose the following hypothesis:

H5: PR significantly influences attitude toward e-banking adoption.

2.6. Individual Attitude and Intention to Adoption of E-Banking

Collective behaviour and the strategic demographic decisions cannot change the fact that each individual is heterogeneous, irrespective of demographic homogeneity. An individual's attitude plays a vital role in the adoption of new information technology systems. Individual attitudes towards new technology acceptance are functions of PU and PEU (Davis, 1989; Davis et al., 1989). The desire to use a new system is driven by positive and negative emotions toward the adoption of new systems (Karjaluoto et al., 2002; Davis, 1989). Attitudes can be positive or negative according to individual situations (Wang et al., 2021; Obaid, 2021). In terms of e-banking adoption, we believe that individuals with positive attitudes will continue to use it. However, those with negative attitudes will discontinue their use in the future (Wu et al., 2014). In light of the above discussion, hypothesis H6 is proposed:

H6: Attitude significantly influences intention towards e-banking adoption.

2.7. E-Banking Adoption and the post-pandemic COVID-19 situations

During the COVID-19 pandemic, our lives experienced a profound transformation, including the realm of banking services. With physical restrictions and limited access, the indispensability of the banking system became even more apparent, particularly in times of pandemic. Consequently, e-banking emerged as a key requirement for facilitating immediate financial support for the masses.

Verma and Tanwar (2022) conducted a study to examine the influence of the COVID-19 pandemic on e-banking usage in India. Their findings revealed a notable surge in the rate of e-banking adoption in India during the pandemic. With the implementation of lockdowns and social distancing measures, customers increasingly turned to digital channels to accomplish their banking needs.

Overall, the COVID-19 pandemic has brought about significant changes in customer behaviour, and it is worthwhile to investigate its effect on the adoption behaviour of e-banking customers in rural areas. Therefore, in the proposed model, the post-pandemic COVID-19 situations is introduced as a replica of external pressure (change) and considered as a moderating variable at different levels of hypothesised relationships. It moderates the factors influencing e-banking adoption (PU, PEU, SN, PR, and Trust) and individuals' attitudes. Furthermore, it moderates the relationship between individuals' attitudes and intentions towards e-banking adoption. Based on the above discussions, the following hypotheses are proposed:

H7: Post-pandemic COVID-19 situations moderate between Trust and Attitude toward e-banking adoption.

H8: Post-pandemic COVID-19 situations moderate between PU and Attitude toward e-banking adoption.

H9: Post-pandemic COVID-19 situations moderate between SN and Attitudes toward e-banking adoption.

H10: Post-pandemic COVID-19 situations moderate between PEU and Attitude toward e-banking adoption.

H11: Post-pandemic COVID-19 situations moderate between PR and Attitude toward e-banking adoption.

H12: Post-pandemic COVID-19 situations moderate between Attitude and intention toward e-banking adoption.

A conceptual framework was developed based on the aforementioned literature and the proposed hypotheses (Figure 1).

Minnesota Journal of Business Law and Entrepreneurship

Volume 2026, No. 1

ISSN: 1540-3270

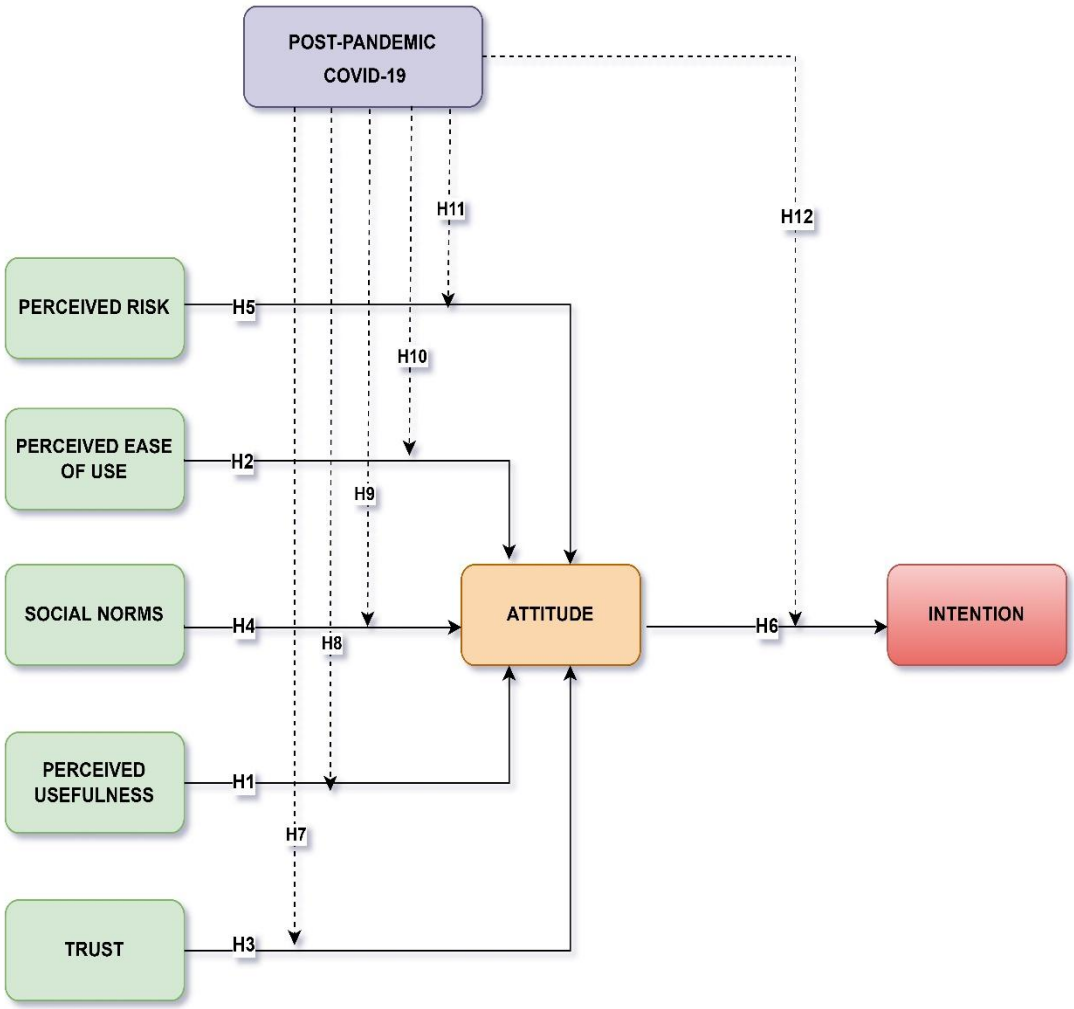

FIGURE 1: CONCEPTUAL FRAMEWORK FOR INTENTION TO ADOPT E-BANKING SERVICES

3. Research Methodology

As a research methodology, this study employed a cross-sectional survey to enable close emotional, mental, and opinion-based interaction between the researcher and respondents, thereby facilitating easier generalisation of the results (Zikmund et al., 2003; Phellas et al., 2011; Creswell and Creswell, 2017). Although survey or self-reported approaches are inherently associated with the limitation of response bias, they are effective tools for measuring perceptions, attitudes, and situational circumstances of individuals (Smith, 2018). Data collection was conducted anonymously and confidentially to uphold principles of honesty and authenticity among participants (Raza et al., 2020). The sampled residents of Bihar from rural areas with bank accounts in commercial banks were selected. Data was collected in the district of Muzaffarpur, specifically from four villages within the Musahari Block (Dighra Patti, Narauli, Sherpur, and Susta). The questionnaire was administered both online and offline, using convenience sampling between November 2021 and April 2022. Convenience sampling involves selecting samples that are readily available and accessible (Raza et al., 2013; Raza et al., 2017). In this context, four accessible villages were sampled within the research period. For the online modality, a digital copy of the

questionnaire was sent to randomly selected customers via email (Singh and Malik, 2019). Email addresses were obtained from branches of the Bank of India and Bank of Baroda. Offline data collection involved visits to individual branches and ATMs in the four villages of Muzaffarpur (Dighra Patti, Narauli, Sherpur, and Susta). A total of 500 online and 250 offline questionnaires were distributed, resulting in 90 and 456 responses respectively. The low response rate in the online mode can be attributed to the challenges faced by the rural population in providing responses, owing to their limited familiarity with digital technology (Singh and Malik, 2019). After filtering out 28 incomplete responses, 518 complete responses were retained for data preparation and subsequent analysis. There is no fixed criterion for determining the required sample size in behavioural studies (Osborne and Costello, 2004). As Kline (2015) notes, the number of cases per measured parameter should be at least ten; therefore, a sample size of 518 is adequate to meet the statistical requirements for analysing the proposed conceptual model, which involves 36 items on the scale. The measurement scales were based on existing literature and were refined to suit the study's needs. The questionnaire was divided into two parts: the first part contained five questions related to demographic attributes; the second part included eight constructs, each assessed by 33 items, which were PR, PEU, SN, PR, Trust, post-pandemic COVID-19 circumstances, Attitude, and Intention towards e-banking. All items were evaluated using a five-point Likert scale (Table I).

Table I: Constructs, Measuring Items in Questionnaire and Sources of Adoption

Constructs	Measuring scale items	Sources
Perceived usefulness	1. Do you find e-banking services cost-effective? 2. Is Information provided through e-banking up-to-date and accurate? 3. Is it providing a sufficient Range of Products/Services? 4. Is it providing updated and latest offer availability? 5. Are e-banking websites well organised?	**Chaurasia et al., 2019**
Perceived Ease to use	1. Do you think that e-banking services are time-saving? 2. Are e-Banking services easy to use? 3. Are e-banking services Compatible with Mobile Phones? 4. Is it providing comfortable financial transactions accessible at your doorsteps?	**Govender & Sihlali, 2014**
Trust	1. Are e-Banking services safe and secure? 2. Do you feel more secure as Password Protection provides more transaction security? 3. Is it good to maintain your transaction Confidentiality? 4. Are you thinking that banks are Trustworthy for using e-Banking services?	**Shankar & Jebarajakirthy, 2019**
Social Norms	1. Are your friends also using e-banking? 2. Are your friends and family motivating you to use e-banking services? 3. Does it work everywhere?	**Daka & Phiri, 2019**

	4. Are you feeling updated by using e-banking? 5. Do you get information about e-banking through your colleagues or peer groups?	
Perceived Risk	1. Are you facing transaction Difficulty? 2. Do you feel at Risk of Fraud? 3. Is there are Risk of technological failure? 4. Do you feel at risk of listening to news of online fraud?	**Kishore & Sequeira (2016)**
Post-pandemic COVID-19 situations	1. Are you feeling more comfortable using e-banking after the COVID-19 pandemic? 2. Does it help in maintaining peace of mind? 3. Are you getting more habituated to using e-banking during the COVID-19 pandemic? 4. Is the COVID-19 pandemic automatically compelling you to adopt e-banking? the	**Meghani & Gokhru (2020); Patel (2020).**
Attitude towards e-banking	1. Do you feel comfortable learning and adopting e-banking? 2. Is it quickly assessable and provides Quality Services? 3. Is it reducing the dependency on banking staff? 4. Is it reducing the chances of manual errors? 5. Are e-banking services user-friendly in nature?	**Amin & Ramayah, 2010**
Intention towards e-banking	1. Would you recommend e-banking to your family and friends? 2. Would you prefer more e-banking than the traditional system of banking? 3. Would you like to share your situation with the e-banking service provider? 4. Would you intend to continuously use e-banking in future? 5. Are you satisfied with the e-banking services?	**Adesina and Ayo, 2010**

3.1. Participant's description

The demographic profile of the sample (Table II) shows that 56.9% of respondents were male and 43.1% female. In terms of age, 49.8% were between 35–50 years, 32.2% were 18–35 years, and 18% were above 50 years. Educationally, 22.2% had below-matriculation qualifications, 27.2% were matriculates, 27.8% had intermediate qualifications, 17% were graduates, and 5.8% held postgraduate or professional degrees. Income distribution revealed 28.8% earning below ₹5 lakhs annually, 39.2% earning ₹5–10 lakhs, 16.4% in the ₹10–15 lakhs bracket,

and 15.6% above ₹15 lakhs. Occupationally, 43.25% were self-employed, 22.39% dependents, 19.88% worked in government or semi-government roles, and 14.48% were retired individuals.

Table II: Demographic Characteristics of Respondents

Variables	**Respondents' Demographic Characteristics**	**Frequency**	**(%)**
Gender	Male	295	56.9
	Female	223	43.1
Age	18-35	167	32.2
	35-50	258	49.8
	50 and above	93	18
Education	Below Matriculation	115	22.2
	Matriculation	141	27.20
	Intermediate	144	27.80
	Graduate	88	17
	Post-graduate/Professional degree	30	5.8
Income	Less than 5 lacs p.a	149	28.8
	5 lacs -10 lacs p.a	203	39.2
	10 lacs – 15 lac p.a	85	16.4
	15 lacs & above	81	15.6
Employment	Self	224	43.25
	Dependent	116	22.39
	Government/Semi-Govt	103	19.88
	Retired	75	14.48

Note: *N=518, Source: Author's compilation*

4. Data Analysis

To ensure data integrity, an initial validation step was conducted to identify missing values and outliers. The Distance measure provided by Cook was the primary diagnostic tool used to detect influential outliers and assess compliance with normality assumptions. Data points with Cook's Distance greater than 1 were deemed influential

and were removed according to established guidelines (Vander Meer et al., 2010; Stevens, 1984). Additionally, the distributional properties of the data were evaluated by calculating skewness and kurtosis. It was further determined that skewness and kurtosis values were within the normal range; that is, skew was less than 3, and kurtosis was less than 10, which proved that there is no violation of the assumptions of normality (Kline, 2011). Statistical analyses with the validation of the data were carried out in series with the use of IBM SPSS Version 21 and AMOS Version 26. The software packages made it easy to apply the Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA) and Structural Equation Modelling (SEM) used to examine and determine the relationship between the observed variables and the latent constructs (Kaiser, 1974; Hu and Bentler, 1999; Ho, 2006).

Results

Exploratory factor analysis (EFA) was conducted using varimax rotation in order to isolate and retain statistically significant factors meeting Kaiser normalization criterion. The adequacy of the sample was questioned by their Kaiser-Meyer-Olkin (KMO) measure and the general factorial adequacy and construct validity was assessed by the test of Bartlett on sphericity. The test used to establish the statistical significance of the data (Bartlett test) showed that the data was fit to EFA, with p being below 0.05. The confirmation of the necessary requirements was presented in a KMO of 0.848, which is far beyond the required level of 0.70, and a Bartletts test with the result of $p < 0.05$, thus proving the appropriateness of the dataset to the use of factor analytical tests (Kaiser & Rice, 1974). As a result, the analytical model included seven variables as shown in Table III.

Table III: Rotated Component Matrix

Component

Construct	1	2	3	4	5	6	7	Alpha
INADOP4	.927							
INADOP2	.916							
INADOP5	.914							.956
INADOP1	.908							
INADOP3	.772							
ATTIT2		.948						
ATTIT3		.947						
ATTIT4		.806						.920
ATTIT5		.776						
ATTIT1		.746						
PEASE2			.956					
PEASE1			.952					.989
PEASE3			.935					
PEASE4			.924					
SN2				.918				

SN5	.831				
SN4	.816				.885
SN1	.804				
SN3	.786				
PEU2		.812			
PERU4		.801			.862
PERU1		.801			
PERU5		.793			
PERU3		.788			
TRUST2			.893		.905
TRUST4			.887		
TRUST1			.859		
TRUST3			.550		
PRISK1				.808	
PRISK4				.781	.785
PRISK3				.760	
PRISK2				.744	

"Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalisation.

a. Rotation converged in 6 iterations."

5.1 Measurement of Reliability, Validity and Dimensionality

Confirmatory Factor Analysis (CFA) was conducted to identify the strength of measurement model and the constructs in the model. The results showed high level of correspondence between the proposed model and the data by the empirical data. A variety of goodness-of-fit statistics supported this fit: $\chi^2/df = 1.747$, GPI = 0.918, AGFI = 0.899, CFI = 0.982, NFI = 0.960, RMSEA = 0.038, SRMR = 0.032, and IFI = 0.983, which all assumed reasonable values, that is, a good-fitting model. A set of alpha coefficients of Cronbach was computed to determine internal consistency, in respect to each construct. The alpha values were within the range of 0.785 and 0.989, which is greater than the standard level of reliability of 0.70, thus representing the reliability of the constructs (Hair et al., 2006). Besides internal consistency, the validity of the model has been researched in the form of Composite Reliability (CR), standardised Factor Loadings (FL) and Average Variance Extracted (AVE). The factor loadings were all greater than 0.60, as shown in Table IV, which means that there was a high indicator reliability level since there was a range between 0.613 and 0.992.

In addition, the AVE scores were between 0.689 and 0.977, and this is higher than the minimum of 0.50, indicating that the convergent validity is satisfactory. Collectively, these findings enable to conclude that the proposed model possesses high level of reliability, convergent and discriminant validity (Hair et al., 2006).

Table IV: Result of Confirmatory Factor Analysis (factor loading (FL), validity and reliability)

Construct	Items	FL	α	AVE*	C.R
Intention to Adopt E-Banking	INADOP1	0.95	0.956	0.911	4.153
	INADOP2	0.965			
	INADOP3	0.722			
	INADOP4	0.954			
	INADOP5	0.966			
Attitude Towards E-Banking	ATTIT1	0.756	0.92	0.866	3.753
	ATTIT2	0.987			
	ATTIT3	0.986			
	ATTIT4	0.806			
	ATTIT5	0.797			
Perceived Ease of Use	PEASE1	0.991	0.989	0.977	3.818
	PEASE2	0.992			
	PEASE3	0.978			
	PEASE4	0.947			
Social Norms	SN1	0.750	0.885	0.785	3.084
	SN2	0.936			
	SN3	0.713			
	SN4	0.752			
	SN5	0.776			
Perceived Usefulness	PERU1	0.74	0.862	0.746	2.78
	PERU2	0.753			
	PERU3	0.733			
	PERU4	0.754			
	PERU5	0.748			
Trust	TRUST1	0.72	0.905	0.744	2.216
	TRUST2	0.779			

	TRUST3	0.712			
	TRUST4	0.766			
Perceived Risk	PRISK1	0.796	0.785	0.689	1.898
	PRISK2	0.615			
	PRISK3	0.613			
	PRISK4	0.731			

(Note: AVE**= Average Variance Extracted; **CR**=Composite Reliability)

5.2 Measurement of Goodness of Fit Indices

Structural Equation Modelling (SEM) was employed to validate the proposed structural framework. Based on the literature review, a theoretical model was developed, and a pilot study was carried out to examine the relationships between critical factors influencing electronic banking adoption. These included PU, PEU, SN, PR, and Trust, along with users' attitudes and their behavioural intentions to engage with e-banking platforms. The SEM results demonstrated that the structural model fit the observed data well. This was supported by various fit indices, all remaining within acceptable ranges: $\chi^2/df = 1.929$, GFI = 0.910, AGFI = 0.892, CFI = 0.978, NFI = 0.955, RMSEA = 0.042, SRMR = 0.081, and IFI = 0.978, in accordance with the guidelines proposed by Hair et al. (2006). Moreover, the model exhibited substantial explanatory power, accounting for 49% of the variance (adjusted R^2 = 0.49) in behavioural intention to adopt e-banking services.

5.3 Hypothesis testing

The hypothesis was examined through Structural Equation Modelling (SEM). The analysis of standardised path coefficients revealed that several factors significantly influence users' attitudes toward e-banking services. Specifically, PU ($\beta = 0.115$, $p < 0.05$), PEU ($\beta = 0.088$, $p < 0.05$), and Trust ($\beta = 0.409$, $p < 0.01$) demonstrated a positive and statistically significant association with attitude. Conversely, PR showed a significant negative effect on attitude ($\beta = -0.126$, $p < 0.05$). SN, however, did not exhibit a statistically significant influence ($\beta = 0.064$, $p > 0.05$).

Furthermore, the findings indicated that attitude toward e-banking had a strong positive relationship with the intention to adopt such services ($\beta = 0.419$, $p < 0.01$). These results suggest that among rural users, PU, PEU, PR, and Trust play critical roles in shaping either favourable or unfavourable attitudes toward the adoption of electronic banking (see Table V).

Table V: SEM output for Hypothesised path Model

Structure Path Estimates	**β Coeff.**	**t-value**	**p-value**	**Decision**
H1: PU→ Attitude towards e-banking	0.115	2.611	0.009	Accepted
H2: PEU → Attitude towards e-banking	0.088	2.031	0.042	Accepted
H3: Trust → Attitude towards e-banking	0.409	9.480	0.000	Accepted
H4: SN → Attitude towards e-banking	0.064	1.557	0.120	Rejected

H5: PR → Attitude towards e-banking	-0.126	-2.770	0.006	Accepted
H6: Attitude → Intention to adopt e-banking services	0.419	10.204	0.000	Accepted

Source: SPSS output

5.3 Moderating Effect of Post-pandemic COVID-19 Situations

This study employed Hierarchical Multiple Regression using the Process Macro in SPSS (Hayes, 2013) to assess the moderating effect of Post-pandemic COVID-19 situations (M) on the relationship between attitude towards e-banking (IV) and the intention to adopt e-banking services (DV). The interaction term was included in the model to determine if the relationship between the independent and dependent variables changed with variations in the moderating variable. The findings, as shown in Table VI, reveal that Post-pandemic COVID-19 situations significantly moderated the relationship between Trust and Attitude towards e-banking adoption (H7: β = .1468, t = .0519, p = .0048). This suggests that the positive link between Trust and Attitude strengthened during the post-pandemic period. Figure 3 further illustrates that individuals with high trust demonstrated a greater inclination towards adopting e-banking under high post-pandemic situations, while those with low trust showed minimal change.

In contrast, the moderating effects were insignificant for Perceived Usefulness (H8: β = -.0560, t = -.9083, p = .3641), Social Norms (H9: β = .340, t = 1.7662, p = .0780), Perceived Ease of Use (H10: β = -.0627, t = -1.0818, p = .2799), and Perceived Risk (H11: β = -.0110, t = -.1372, p = .8909), as shown in Table VI. Similarly, the interaction effect of post-pandemic situations on the relationship between Attitude and Intentions towards e-banking adoption (H12: β = -.0788, t = -1.6915, p = .0914) was also found to be insignificant.

Table VI: Result of Moderation: Interaction's effect of COVID-19 Pandemic between Trust and Attitude

Antecedent	**Trust and Attitude**					
	Beta	Std. Error	T	p-value		F (3,514)
(Constant)	2.7357	.6245	4.3806	.0000	.2756	8.013
Trust	-.1135	.2040	-.5562	.5784		
Pandemic	-.2799	.1665	-1.6813	.0933		
Perceived Trust x post-Pandemic	.1468	.0519	2.8309	.0048		

*Note: * p <.05, ** p <.01, *** p <.001*

Table VII: Hypothesis Results

Hypothesis	**Results**
H1: PU significantly influences attitude towards e-banking adoption.	Accepted
H2: PEU significantly influences attitude towards e-banking adoption.	Accepted

H3: Trust significantly influences attitude towards e-banking adoption.	Accepted
H4: SN significantly influences attitude towards e-banking adoption.	Rejected
H5: PR significantly influences attitude towards e-banking adoption.	Accepted
H6: Attitude significantly influences intention towards e-banking adoption.	Accepted
H7: Post-pandemic COVID-19 situations moderate between Trust and Attitude towards e-banking adoption.	Accepted
H8: Post-pandemic COVID-19 situations moderate between PU and Attitude towards e-banking adoption.	Rejected
H9: Post-pandemic COVID-19 situations moderate between SN and Attitude towards e-banking adoption.	Rejected
H10: Post-pandemic COVID-19 situations moderate between PEU and Attitude towards e-banking adoption.	Rejected
H11: Post-pandemic COVID-19 situations moderate between PR and Attitude towards e-banking adoption.	Rejected
H12: Post-pandemic COVID-19 situations moderate between Attitude and intention towards e-banking adoption.	Rejected

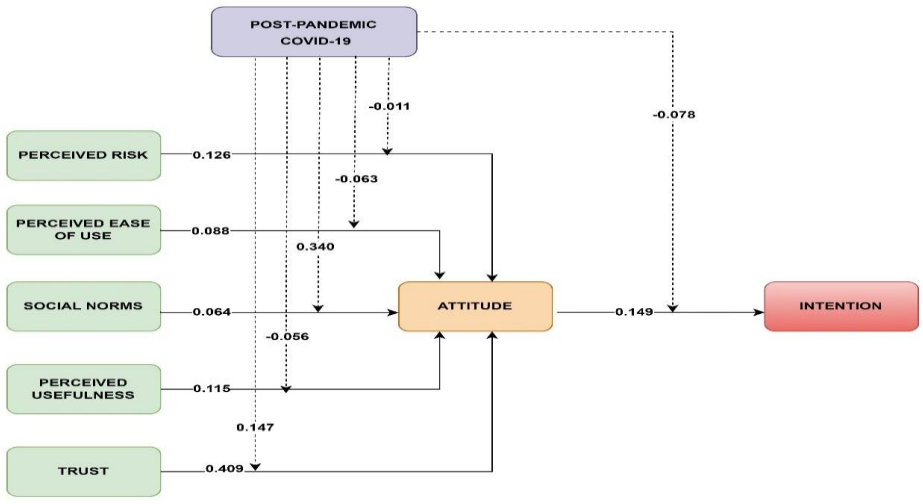

FIGURE 2: CONCEPTUAL FRAMEWORK FOR INTENTION TO ADOPT E-BANKING SERVICES

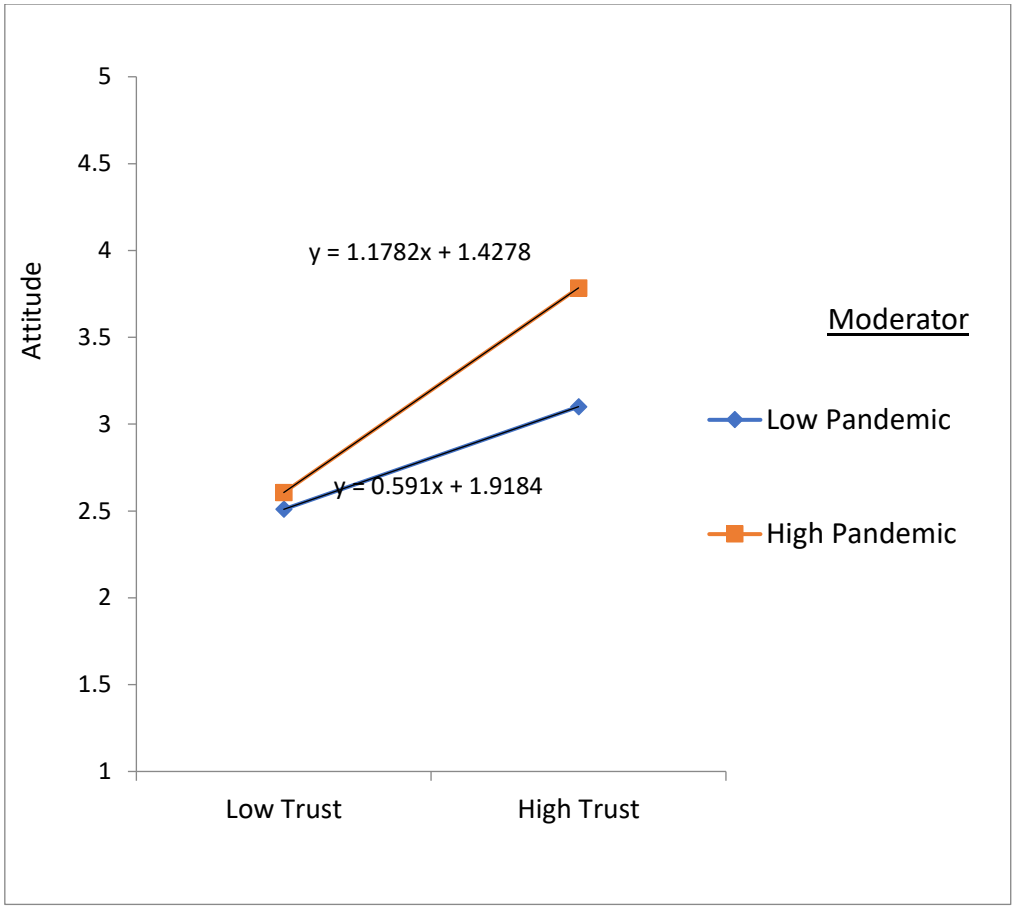

Figure 3: H7: Post-pandemic COVID-19 situations strengthen the positive relationship between Perceived Trust and Attitude.

6. Discussion

The present study adds to the growing body of literature on e-banking adoption among rural populations in India, with a particular focus on the moderating effect of the post-pandemic COVID-19 situation. Using an integrated research framework, the study highlights the factors influencing the attitudes and intentions of rural customers towards e-banking adoption and examines the implications of the pandemic on these dynamics. The findings are consistent with previous research in the field of e-banking. However, it also provides new insights into the role of trust within the specific context of rural populations.

Consistent with previous studies, the results emphasise the importance of PU, PEU, Trust, and PR in this research. Trust has proven to be a crucial factor in predicting the positive attitudes and intentions of the rural population towards e-banking adoption (Andrea et al., 2021; Tavera-Mesias et al., 2022). Trust becomes especially vital when there is ongoing uncertainty in economic and social relationships. However, all transactions require some level of trust, particularly those conducted in uncertain digital environments (McKnight et al., 2020). The positive link between trust and attitudes towards e-banking adoption underscores the need to establish and foster trust in online financial transactions, especially among rural communities. Building trust through secure and transparent e-banking platforms can promote greater acceptance and uptake of these services.

Although, after the disruption caused by the Covid-19 pandemic, an increase in trust was observed among rural customers regarding e-banking service providers, this has not resulted in the desired rapid rate of adoption. In the present study, trust in the rural population increased during the Covid-19 situation as fewer people in rural areas were compelled to use this e-banking system. However, most remain sceptical about adopting technology or e-

banking services due to their limited experience and knowledge of information technology (Singh and Malik; 2019).

The study predicts that social norms no longer serve as a motivating factor in rural customers' e-banking adoption. This finding aligns with the study by Daka and Phir (2019) concerning customers in Zambia. However, it contradicts previous research on the e-banking adoption behaviour of the Indian population (Kishore and Sequeira, 2016). Such contrasting outcomes may be explained by the fact that most people prefer to handle financial issues privately and discreetly, which could diminish their reliance on social communities (Akhtar and Das, 2019).

Additionally, among rural people, the slow adoption of e-banking may be due to their limited familiarity with digital platforms (Singh and Malik; 2019). Low familiarity can lead to a high perceived risk that discourages rural people from using e-banking services, as they are frightened by various fraud stories or account hacking reports that appear daily on news channels, and social media platforms may also deter rural people from giving in to social pressure on financial matters (Steyn, 2018). Therefore, in the case of the rural population, banks need to develop more secure digital platforms to encourage the adoption of e-banking (Haddad and Hornuf, 2019).

The restricted mobility of the population due to the Covid-19 pandemic has increased the adoption of digitalisation in the financial sector, providing valuable learning opportunities. However, the banking industry in emerging economies like India faces various challenges because of inadequate infrastructure, which prevents much of the marginalised population from accessing electronic banking services. Since the rural population lacks a clear understanding of the benefits and ease of e-banking, their adoption remains slow (Sinha and Mukherjee, 2016). Due to these issues, pandemics have not significantly accelerated e-banking adoption among India's rural communities (Abhishek Sharma, 2021). Therefore, it is crucial for the banking sector and the government to take the initiative to develop sufficient infrastructure in rural areas. They should also raise awareness about the advantages and usefulness of e-banking services.

7. Conclusion

This study conducted a detailed investigation into the factors influencing rural customers' adoption of e-banking. It used EFA to identify seven key factors, which were then further analysed. To verify the validity and reliability of these constructs, CFA was performed. The fit indices showed that the proposed model effectively explained the data and had good explanatory power. SEM hypothesis testing revealed that PU, PEU, and Trust significantly and positively influenced rural customers' attitudes towards e-banking, while perceived risk had a negative effect. Conversely, Social norms showed no significant link with attitudes. Additionally, positive correlations were observed between attitudes towards e-banking and the intention to adopt it.

The study also examined the moderating role of the post-pandemic Covid-19 situation on the relationship between various factors and customers' attitudes towards e-banking adoption. The findings showed a positive interaction between trust and attitude, suggesting that the post-pandemic period strengthened the positive connection between trust and e-banking adoption. However, an insignificant interaction effect was observed between PU, PEU, social norms, PR, and customers' attitudes towards e-banking adoption. Additionally, it indicated that the pandemic experience had no significant interaction effect on the relationship between attitudes and customers' intention to adopt e-banking.

Limitations and Future Research

It is important to note that this study has some limitations. The research was conducted within a specific context, focusing on rural populations and their adoption of e-banking services, with a small sample size. The generalisability of the findings is limited as cultural and geographical diversity were not considered. Additionally, this study relied on self-reported data, which may introduce response biases. Future research could consider a longitudinal approach and include a more diverse sample to enhance the external validity of the model.

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