Pollster j. acad.res. 10 (01) 51-70, 2023
© Pollster Journal of Academic Research, Pollster Publications
ISSN: 2411-2259, 2023, Vol (10), Issue (01)
www.pollsterpub.com

Barriers in the Adoption of Smart Contract in Trade Finance

Mehrun-Nisa[1]*

[1] Department of Islamic and Conventional Banking (DICB), Institute of Business, Management and Administrative Sciences (IBMAS), the Islamia University of Bahawalpur (IUB), Bahawalpur, Pakistan. Email: mehar.latif91@gmail.com

Correspondence: mehar.latif91@gmail.com

Abstract

This study investigates the barriers to the adoption of smart contract in trade finance from the perspective of Pakistani business educated people, banking officials, and investors who understands import and export business in Pakistan. The objective of this study is to examine the factors that influence individuals' Behavioural Intention (BI) to embrace smart contracts in the context of trade finance. Using Smart PLS bootstrapping, this study examines the associations between a set of independent factors, which include Performance Expectancy (PE), Effort Expectancy (EE), Perceived Ease of Use (PEU), Perceived Utility (PU), Facilitating Conditions (FC), Environmental Concerns (EC), Trust (T) and Social Influence/Competition (SI), Subjective Norm (SN) and the dependent variable, BI. The results indicate that there are noteworthy positive connections between EE, PE, PEU, Perceived Usefulness (PU), and Social Influence (SI) with Behavioural Intension (BI). These findings are consistent with established theories on technology adoption. Nevertheless, the hypotheses pertaining to EC, FC, SNs (SN), and Trust (T) lack empirical evidence. Technological-Organizational-Environmental (TOE) Framework and Technological Acceptance Model are used to derive the factors expected to affect the adoption of smart contract in trade finance. As the emerging smart contract technology could potentially reshape the trade financing landscape, understanding the factors affecting the adoption of the technology for trade finance is of great importance.

Keywords: Trade Finance, Smart Contract, Technology Acceptance Model (TAM), TOE Framework, Technology Adoption Barrier.

INTRODUCTION

Block chain based smart contract is an exciting new technology that is paving the way for unparalleled levels of connectivity between trading parties. However, the adoption of this innovative technology is accompanied by a slew of concerns and challenges that hamper its implementation in banks and can overshadow its benefits. It is estimated that seventy-five percent of exporters in Latin America and the Caribbean re-entered data into their systems before submitting the paperwork to the local trade-related agencies (Labadi & Khelil, 2022). Posting, replicating, and re-posting data compromises flexibility, and transparency, and create vulnerability to malicious alteration. In a test for delivering avocados from Mombasa to Rotterdam, the cost of associated paperwork was 15-20 percent of the entire transportation cost (Allison, 2017).

Over the course of time, there has been a transformation from conventional paper-based procedures to digital platforms, leading to enhanced effectiveness and decreased

transaction durations. Notwithstanding the advancements made, trade finance continues to be afflicted with inefficiencies, exorbitant expenses, and vulnerability to fraudulent activities. To effectively tackle these challenges and bolster the trade finance ecosystem, it is imperative to embrace cutting-edge technology, such as smart contracts. Nevertheless, despite the considerable progress made in financial technology, the trade finance industry has exhibited a somewhat sluggish response in embracing cutting-edge technologies like smart contracts. Finally, the study wishes to achieve the following research objectives:

1. The objective of this study is to identify the primary obstacles that impede the widespread use of smart contracts within the trade finance sector.
2. The objective of this study is to inspect the affect of PU and Perceived Ease of Use (PEU) on Behavioural Intention (BI).
3. The objective of this study is to analyze the impact of Performance Expectancy (PE) and Effort Expectancy (EE) on the adoption of smart contracts in the field of trade finance.
4. To evaluate the impact of social elements, such as SI and SNs, on the BI to embrace smart contracts, a comprehensive assessment was conducted.
5. The aim of this study is to investigate the effect of EC and trust on the acceptance and utilisation of smart contracts.
6. To estimate the effect of enabling conditions on the adoption of smart contracts in the domain of trade finance.

Despite many comprehensive studies, accessing the efficiency of the blockchain-based system and presenting a workable model for the smart contract, few have focused on its adoption for trade finance operations. Our thesis is an addition to the present literature from multiple standings. Firstly, the adoption of smart contract has been studied in various industries like Supply chain Finance, Insurance industry, cross border payment transactions. However, limited literature is available for using smart contract for trade finance digitalization. Secondly the three models have been integrated to study the relevant variables. In addition to this, our work is quantitative research where barriers have been quantified by the using the primary data from the above explained focus group.

LITERATURE REVIEW

Each International trade transaction initiates hundreds of processes at the same time, which are recorded in the systems of each participant as they occur. Throughout the logistic chain, these data sets undergo replication in the system of each participant. In domestic trade, identities can be verified through the national identity number or business registration number. But in global marketplace, verification requires expensive and time-consuming authentication of documents from relevant consulates.

Trade finance could leverage blockchain technology, particularly its advances like Smart contracts, to converge cross-border trade and to fully connect end-to-end users (Civelek & Özalp, 2018). Instead of electronic documents stamped with electronic

signatures acceptable under different jurisdictions, it is a more favourable way to launch a single and secure document for multiple purposes (Chang et al., 2019). The idea of a Smart contract was first proposed by Nick Szabo in 1990. It is a linear tamper-proof contract that can include multiple users at a time (Civelek et al., 2018), this e-contract cannot only communicate with the parties but can also interact with one another through message exchange (Hu et al., 2020). Garg (2022) pointed out that it is also conceivable to convert legal provisions of the trading contract into computer code without involving blockchain, but such a contract would lack trust, and parties would not be able to run smart contract on each other's node. He further declared blockchain as the ideal platform for smart contract.

Many developing countries are now researching ways for full integration and to bring all parties of trade on one platform and to adapt their operations to the digital age. Later that year, blockchain was successfully utilized by Schneider Electric for the entire process from raising a purchase order to the goods being delivered (Allison, 2017). The platform made use of blockchain-based smart contract technology to provide clients with a safe, innovative, and enabling trading environment (EU-Startups.com, 2017). A paper offered in the records of the congress of UNCITRAL 2017, mentioned that a project named "Inco chain" from the term Incoterms, has been launched to create "Smart contracts for the world" aiming to build a completely paperless and mobile application type international trade process.

Blockchain is a radical innovation that can either form new industries or make the existing one more efficient. (Blidholm & Johnson, 2018) found that despite the high cost associated with research and development for blockchain implementation, the advantages of blockchain in terms of automation, efficiency and simplicity can overtake the expensive investment in long run. The Smart contract is the second-generation technology of blockchain (Aikio, 2018) after cryptography. The idea of smart contract was first presented by Nick Szabo in 1994. Smart contracts are the network computation based on conditional terms agreed between the related parties at the time of trade contract. These are innately traceable and irrevocable and can also handle sophisticated tasks like signatures, agreement administration and data storage (Xu, 2022).

Many authors have supported the use of smart contract in Islamic banking as well. Mat Rahim et al. (2018) concluded in their research in 2018 that the smart contract promotes the future of Islamic finance by automating the entire contractual process. In 2019, Antova and Tayachi (2019) supported the work and postulated that the conditions and characteristics of blockchain are in accordance with the Shariah Principles. As far as the payment process is concerned, earlier publications (Bakar et al., 2017) have mentioned the characteristics of trust and transparency and no intermediary involvement for digital currency. Chang et al. (2019) investigates the role of blockchain and smart contracts in improving traditional LC payments with traceability and concluded that it could enhance the efficiency of international trade by offering a safe and distributed working environment for various trade participants. While comparing the two processes, the study determined that blockchain-based payment method provides a better user experience due to their low

transaction cost, less expensive documentation, and great transaction transparency. Lawal (2019) even went further to prioritize cryptocurrency which satisfies five attributes of money in Islam, over fiat money, which only satisfies two or three. Closely related to our work, studied the practical implications of block-chain based smart contract for financial sectors. Numerous scholarly investigations have underscored the prospective benefits of smart contracts within the realm of trade finance: Smart contracts possess the capability to diminish the duration and expenses linked to trade finance procedures. According to Mougayar (2016), the automation of jobs and removal of middlemen can enhance the efficiency of transactions and reduce operating costs. The utilisation of smart contracts has the potential to enhance accessibility and inclusivity within the realm of trade finance. This technology has the capacity to democratise the field, so enabling a broader spectrum of firms, including SMEs, to participate. Previously, these SMEs encountered obstacles that hindered their admission into the trade finance sector.

Research Hypotheses

EC

To analyse the impact of EC of the user to adopt smart ways for trade financing, the definition of EC contains different perspectives from literature. Our definition of EC contains the factor of sustainability. Sustainable finance holds immense importance when dealing with globalized world. In the wake of the recent pandemic, Pakistan's economy has suffered loss of USD 1.3 trillion, with the adverse impact on international trade. The bracket of EC also includes the role of smart contract for Industry Innovation and Infrastructure.

EE

EE is a construct of UTAUT. The model explains the terms as the level of PEU associated with the use of the technology. EE is predicted on the notion that there are associates between the amount of hard work put at work, the result attained, and the benefits obtained. For our thesis, the term EE measures the perception of the user regarding the effort input required for trade financing processes and decisions after the adoption of smart contracts.

FC

According to authors, FC refers to the extent to which an individual believes that the organizational and technological infrastructures essential for technology exist. The application of smart contracts for trade finance is contingent on the availability of organizational resources (human and material) and technical infrastructures.

PE

The term describes the conviction that the utilizing a particular technology will be beneficial and make daily tasks easier (Venkatesh & Davis, 2000). According to several

studies, PE is a key indicator of long-term technology use (Onaolapo & Oyewole, 2018). For our thesis, the term PE refers to the perception that adoption of smart contract will enhance trade finance performance goals.

PEU

PEU is described as an individual's conviction that using a detailed technology will be effortless. As an individual's PEU with a given technology grows, so do their intentions to use it. In the context of smart contract, we have defined PEU as the extent to which a consumer imagines that the contract is free of attempt.

Perceived Usefulness

Usefulness is being defined as the extent to which a customer judges that the smart contract will provide access to useful information, an efficient way to process data, a convenient way to complete deadlines and facilitate comparative advantage.

Social Influence

The work of who characterises social influence as a significant accelerator for transformation served as the model for our thesis' definition of social influence. The psychological concepts that fall under the category of social influence affect individuals' attitudes and behaviours in different ways when they are in the real, perceived, or suggested presence of other people (Stibe et al., 2019). "The extent to which the user believes that the other stakeholders involved in the cross-border transaction would prefer him/his adoption of smart contract for trade financing" is the definition that we have modified for our study.

SN

The extent to which a person supposes that the people who matter to them will accept them for adopting a specific behaviour is referred to as their SN (Gagnon et al., 2012). This concept has been adapted to emphasise the importance of the related person important to the trader e.g family, friends, work colleagues and society (Ham et al., 2015). The term of SN has been adapted as the influence of referent groups on the adoption behavior for smart contract in trade financing.

Trust

For our thesis, the definition of trust is based the work of who define it as a party's inclination to rely on something or with a feeling of relative security despite the possibility of negative consequences. Cross border business involves a close relationship between trust and risk. In international trade, banks operate as intermediaries, reducing risk to a minimum by managing trust between trading partners across different jurisdiction. The technology underlying smart contract, enables untrusted parties to share data via a distributed ledger (Taxiarchis & Kasanda, 2019). Therefore, trust is a key feature which

governs the decision of the consumer to use the platform to collaborate with the untrusted trading partners.

Behavioural Intensions

BIs imply to the perceived likelihood of an individual to participate in a given behaviour. We have selected BI as a proxy for actual behaviour and define it as the user's intent to use smart contract for trade financing. The study proposes the following hypotheses based on the identified variables:

H1: *There is a connection between EC and the BI to adopt smart contracts in trade finance (BI).*
H2: *There is a connection between EE and the BI to adopt smart contracts in trade finance (BI).*
H3: *There is a connection between FC and the BI to adopt smart contracts in trade finance (BI).*
H4: *There is a connection between PE and the BI to adopt smart contracts in trade finance (BI).*
H5: *There is a connection between PEU and the BI to adopt smart contracts in trade finance (BI).*
H6: *There is a connection between Perceived Usefulness (PU) and the BI to adopt smart contracts in trade finance (BI).*
H7: *There is a connection between SI and the BI to adopt smart contracts in trade finance (BI).*
H8: *There is a connection between SN and the BI to adopt smart contracts in trade finance (BI).*
H9: *There is a connection between Trust (T) and the BI to adopt smart contracts in trade finance (BI).*

METHODOLOGY

The data collection in this study was conducted utilising the Cluster area sampling approach. The main factor contributing to this limitation is the absence of a comprehensive roster of respondents affiliated with trade finance, rendering the utilisation of the conventional random sampling technique unfeasible. Consequently, the survey was limited to a singular location that was chosen using a random selection process. Furthermore, the utilisation of cluster area sampling approach is preferred due to its cost-effectiveness. The current investigation distributed a total of 800 questionnaires to get the required sample size as determined by these assessments and 300 were returned.

The scales utilised for assessing all variables in this study were subject to modifications by prior researchers and were adjusted to accommodate suitable alterations in the sample. The survey questions consist of two primary components. The initial section of the study included the demographic attributes of the participants, while the latter section comprised of closed-ended questions that assessed several factors using a 7-point Likert scale. An online structured questionnaire survey conducted using a google form was utilised in this investigation to collect the necessary data. In addition, this study relied on primary data and was handled in the form of a structured questionnaire survey for the purpose of gathering primary data, in table 1.

Table 1: Scale items for variables under study.

Variable No.	Variable	Item No.	Item code	Item Scale	Ref
1	EC	7	EC1	Promotes traceability	(Mao et al., 2018)
1	EC	8	EC2	Reduce Paper waste	
1	EC	9	EC3	Green finance	
1	EC	10	EC4	Industry Innovation and Infrastructure	(Parmentola et al., 2022)
2	EE	11	EE1	Easy Access	(Onaolapo et al., 2018)
2	EE	12	EE2	Less Costly	(Onaolapo et al., 2018)
2	EE	13	EE3	Reduces Time	(Onaolapo et al., 2018)
2	EE	14	EE4	Avoids Duplication 0f work	(Onaolapo et al., 2018)
3	Facilitating Condition	15	FC1	Presence of Skills and abilities	(Onaolapo et al., 2018)
3	Facilitating Condition	16	FC2	Presence of Governing infrastructure	(Onaolapo et al., 2018)
3	Facilitating Condition	17	FC3	Relevant Trainings	(Onaolapo et al., 2018)
3	Facilitating Condition	18	FC4	Commitment of Governing Bodies	(Onaolapo et al., 2018)
4	PE	19	PE1	Ensure deadlines	(Onaolapo et al., 2018)
4	PE	20	PE2	Value addition	(Onaolapo et al., 2018)
5	PEU	21	PEU1	Easy to use	(Warkentin et al., 2007)
5	PEU	22	PEU2	Easy Learning	(Warkentin et al., 2007)
5	PEU	23	PEU3	Easy Trainings	(Warkentin et al., 2007)
5	PEU	24	PEU4	Easy Handlings	(Warkentin et al., 2007)
5	PEU	25	PEU5	Easy updating	(Warkentin et al., 2007)
5	PEU	26	PEU6	Easy Documentation	(Warkentin et al., 2007)
6	Perceived Usefulness	27	PU1	Quick and efficient	(Warkentin et al., 2007)

6	Perceived Usefulness	28	PU2	Easy Handling	(Warkentin et al., 2007)
6	Perceived Usefulness	29	PU3	Eliminate Intermediaries	(Lennon & Folkinshteyn, 2016)
6	Perceived Usefulness	30	PU4	Enhance Communication	(Warkentin et al., 2007)
6	Perceived Usefulness	31	PU6	Reduces Maintenance Cost	(Lennon et al., 2016)
7	Social Influence	32	SI1	Social Comparison	(Stibe et al., 2019)
7	Social Influence	33	SI2	Social Collaboration	(Stibe et al., 2019)
7	Social Influence	34	SI3	Social Competition	(Stibe et al., 2019)
8	SN	35	SN1	Pressure from Friends	(Ham et al., 2015)
8	SN	36	SN2	Pressure from Family/relatives	(Ham et al., 2015)
8	SN	37	SN3	Pressure from work colleagues/staff	(Ham et al., 2015)
8	SN	38	SN4	Public acknowledgments	(Stibe et al., 2019)
9	Trust	39	T1	Secure Storage	(Moonsamy, 2020)
9	Trust	40	T2	Transparency and Privacy	(Moonsamy, 2020)
9	Trust	41	T3	Safety	(Moonsamy, 2020)
9	Trust	42	T4	Cyber security	(Moonsamy, 2020)
10	Behavioral Intension	43	BI1	Regular Use	(Li & Lai, 2005)
10	Behavioral Intension	44	BI2	Frequent Use	(Li et al., 2005)
10	Behavioral Intension	45	BI3	Recommendation	(Li et al., 2005)

DATA ANALYSIS

PLS-SEM is utilized as a statistical technique to identify and analyse diverse connection effects and moderation, so addressing the research inquiries and accomplishing the research objectives. Consequently, the use of PLS-SEM version 3 was employed by the researcher in the present investigation as shown in table 2.

Table 2: Response Rate of Questionnaire.

Response	Frequency/Rate
Total Questionnaires	800
Questionnaires Completed by investors	481
Questionnaire remained Unfilled	319
Response Rate	60.1%

The use of 481 questionnaires for subsequent analysis is indicative of a valid response rate of 60 percent. A recommended sample size of around 200 participants for PLS-SEM analysis has been suggested by scholars such as Hair et al. (2010). Hence, the study's sample size is 481, while the study employs ten variables, which seem to be the most suitable for statistical analysis, as shown in table 3.

Table 3: Demographic profile of respondents.

Demography	Description	No. of Responses	Per centage
Gender	Male	311	64.66
	Female	170	35.34
Age (in years)	Less than 26	309	64.24
	26-35	133	27.65
	More than 35	39	8.11
Education	Bachelor	287	59.67
	Masters	125	25.99
	MS/MPhil	69	14.34

Measurement Model Results

The present study considers the outer model by employing four criteria, namely the reliability indicator of perceived variables/items, factor loading, discriminant validity and convergent validity as well as model fit evaluation. Figure 1 shows the outer model:

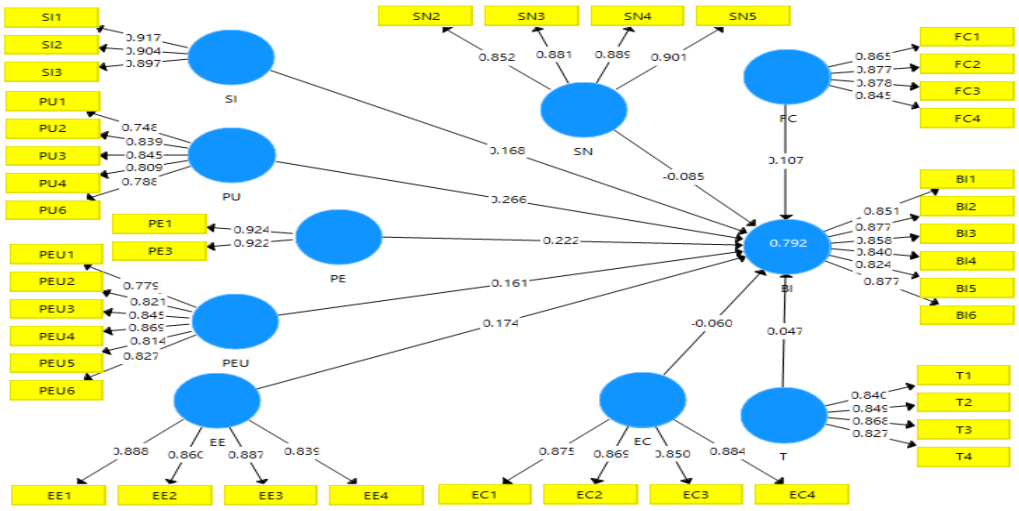

Figure 1: Measurement Model.

Factor Loadings for Indicators Reliability

The current study encompasses ten latent variables, with a total of 44 items, as seen in Table 3. A total of 42 items remained after removing some indicators with a loading factor below 0.700. The presence of lower numerical values does not pose a significant issue, provided that the structural integrity and reliability requirements are satisfied. However, before doing the analysis, two items were excluded due to their low loading values, which had a negative impact on the construct validity and reliability.

Internal Consistency Reliability

Alpha and CR are commonly utilised in evaluating the internal consistency reliability of a construct, since they provide an indication of the effectiveness of the indicators in measuring the construct (Peterson & Kim, 2013). The conclusions for internal consistency reliability are presented in Table 3.

Convergent Validity

The study conducted an evaluation of a convergent validity model using factor loadings for CR and AVE (Hair et al., 2010). Convergent validity, as defined by (Fornell & Cha, 1994), refers to the extent to which an item associated with a certain variable accurately reflects the same underlying notion. Convergent validity is considered acceptable when the value of AVE is equal to or greater than 0.5 (Chin, 1998b).

According to Chin (1998a), Table 3 demonstrates that the recommended value for all item loads surpassed 0.6. The study performed by J. Hair et al. found that the CR values above the recommended threshold of 0.7. Simultaneously, the AVE was utilised to measure the extent of variance in the indicators that can be accredited to the underlying idea. In this study, all the variables investigated met or above the mentioned threshold value, therefore showing convergent validity of the construct in table 4.

Table 4: Indicators loadings, CR, and AVE.

Indicators	Loadings	AVE	CR	Alpha
BI to Use Smart Contracts in Trade Finance		0.731	0.942	0.926
BI1	0.851			
BI2	0.877			
BI3	0.858			
BI4	0.840			
BI5	0.824			
BI6	0.877			
EC		0.756	0.925	0.892
EC1	0.875			
EC2	0.869			
EC3	0.850			
EC4	0.884			
EE		0.755	0.925	0.892

EE1	0.888			
EE2	0.860			
EE3	0.887			
EE4	0.839			
FC		0.751	0.923	0.889
FC1	0.865			
FC2	0.877			
FC3	0.878			
FC4	0.845			
PE		0.852	0.920	0.826
PE1	0.924			
PE2	0.922			
PEU		0.683	0.928	0.907
PEU1	0.779			
PEU2	0.821			
PEU3	0.845			
PEU4	0.869			
PEU5	0.814			
PEU6	0.827			
Perceived Usefulness		0.650	0.903	0.865
PU1	0.748			
PU2	0.839			
PU3	0.845			
PU4	0.809			
PU6	0.788			
Social Influence / Competition		0.821	0.932	0.891
SI1	0.917			
SI2	0.904			
SI3	0.897			
SNs		0.776	0.933	0.904
SN2	0.852			
SN3	0.881			
SN4	0.889			
SN5	0.901			
Trust		0.716	0.910	0.868
T1	0.840			
T2	0.849			
T3	0.868			
T4	0.827			
Note. AVE: average variance extracted; CR: composite reliability.				

Discriminant Validity

According to Henseler et al. (2015), the use of HTMT standards is more favourable than the Fornell-Larcker criteria when it comes to measuring idea discriminant validity. It is recommended that the HTML value be below 0.85 or 0.9, with a preference towards the latter. To assess the discriminant validity, this study employs many criteria. Table 4 states the results pertaining to the assessment of discriminant validity using the Fornell-Larcker criteria, therefore confirming the

presence of discriminant validity. According to Ramayah et al. (2013), the correlations observed between the measure of interest and the measures of other variables were relatively small, indicating a strong discriminant validity for the measure of interest. Table 5 illustrates the values.

Table 5: Discriminant Validity.

Fornell-Larcker Criterion										
	BI	EC	EE	FC	PE	PEU	PU	SI	SN	T
BI	0.855									
EC	0.724	0.869								
EE	0.801	0.736	0.869							
FC	0.727	0.753	0.708	0.866						
PE	0.785	0.724	0.756	0.708	0.923					
PEU	0.787	0.733	0.754	0.715	0.719	0.826				
PU	0.797	0.715	0.738	0.676	0.704	0.791	0.806			
SI	0.744	0.787	0.780	0.719	0.689	0.679	0.655	0.906		
SN	0.617	0.721	0.650	0.786	0.596	0.633	0.601	0.717	0.881	
T	0.702	0.773	0.726	0.779	0.662	0.679	0.650	0.740	0.724	0.846
Heterotrait-Monotrait Ratio (HTMT)										
	BI	EC	EE	FC	PE	PEU	PU	SI	SN	T
BI										
EC	0.794									
EE	0.880	0.824								
FC	0.802	0.842	0.794							
PE	0.896	0.842	0.882	0.825						
PEU	0.856	0.813	0.837	0.796	0.829					
PU	0.886	0.811	0.835	0.768	0.834	0.891				
SI	0.819	0.882	0.877	0.808	0.803	0.754	0.745			
SN	0.672	0.800	0.722	0.875	0.688	0.698	0.675	0.797		
T	0.781	0.876	0.824	0.887	0.782	0.764	0.750	0.840	0.818	

Moreover, as evidenced in Table 5 presented the loadings on each indicator's construct consistently surpass the cross-loadings with other constructions. The findings demonstrate discriminant validity among all constructs, as indicated by the cross-loadings criterion.

Evaluation of Model Fit

The evaluation of model fit in PLS-path modelling is conducted using two reliable indicators. The Standardised Root Mean Square Residual (SRMR), as defined by Hooper et al. (2008), refers to the residual discrepancies that exist between the correlated data of the sample and the predicted correlated model. The range of SRMR values under consideration spans from 0 to 1.

Table 6: Model fit evaluation.

	Saturated Model	Estimated Model
SRMR	0.042	0.042
d_ULS	1.595	1.595
d_G	1.089	1.089
Chi-Square	3036.366	3036.366
NFI	0.835	0.835

The SRMR values obtained from PLS 3 for the structured model and estimated model are 0.042, which is notably lower than the respective thresholds of 0.08 and 0.05 as given in table 6. This demonstrates the suitability of the model under consideration. The NFI (Normed Fit Index) incorporates a threshold value that ranges from 0 to 1, which serves as an additional criterion for assessing the adequacy of model fit. Lohmöller (1988) suggests that an NFI score close to 1 indicates a higher level of fit. The Normal Fit Index (NFI) value obtained in this study is 0.835, indicating a high level of model fit.

The second measure of model fit may be obtained using the following formula:

$$GOF = \sqrt{\overline{\mathbf{R^2}} \times \overline{\mathbf{AVE}}}$$

Based on the prescribed goodness-of-fit (GOF) measure in Table 6, the data exhibits a complete alignment with the intended value of 1, as stated by Tenenhaus et al. (2005). To enhance comprehension, the GOF values have been categorised into three distinct classes. A value of 0.10 indicates that the proposed model is characterised by a tiny quantity. On the other hand, a figure of 0.25 is considered suitable for the data, while 0.36 is seen to be a good fit for the data. The findings of the Goodness of Fit test for the current investigation are presented in Table 7.

Table 7: GoF Index.

Constructs	AVE	R Square
BI	0.731	0.792
EC	0.756	
EE	0.755	
FC	0.751	
PE	0.852	
PEU	0.683	
PU	0.650	
SI	0.821	
SN	0.776	
T	0.716	
$\overline{AVE}$	0.749	
R^2		0.792
$GOF = \sqrt{\overline{R^2} \times \overline{AVE}}$	$\overline{AVE} * \overline{R^2}$	0.5932 0.7702

Pollster j. acad.res. 10 (01) 51-70, 2023
© Pollster Journal of Academic Research, Pollster Publications
ISSN: 2411-2259, 2023, Vol (10), Issue (01)
www.pollsterpub.com

Structural Model

The current investigation employed Smart PLS version 3 (Ringle et al., 2015) to assess the structural model and evaluate the recommended hypotheses. The significant level of the route coefficient, R2, model predictive relevance (Q2), and impact size (f2) are evaluated in the structural model (Shmueli et al., 2016). The authors employed a bootstrapping technique.

The researchers employed the path coefficient to examine the theories put forward in this study. As a result, the researchers decided to employ a bootstrapped approach with a sample size of 5,000, as recommended to determine the significance of path coefficients, this study examined all hypotheses using P-statistics (below 0.05) and t-statistics (above 1.96) (Hair et al., 2011; Preacher & Hayes, 2004). The path coefficients representing the structural relationships have been computed and are presented in Table 8 and Figure 2 to visually depict the obtained results.

Table 8: Structural Estimates (Hypothesis Testing).

Hypothesis		Path Coefficient	T Statistics (|O/STDEV|)	P Values	Decision
H1	EC -> BI	-0.057	1.025	0.306	Rejected
H2	EE -> BI	0.169	3.131	0.002	Supported
H3	FC -> BI	0.109	1.758	0.079	Rejected
H4	PE -> BI	0.226	4.235	0.000	Supported
H5	PEU -> BI	0.159	2.200	0.028	Supported
H6	PU -> BI	0.263	5.483	0.000	Supported
H7	SI -> BI	0.168	3.143	0.002	Supported
H8	SN -> BI	-0.081	1.824	0.069	Rejected
H9	T -> BI	0.045	0.874	0.382	Rejected

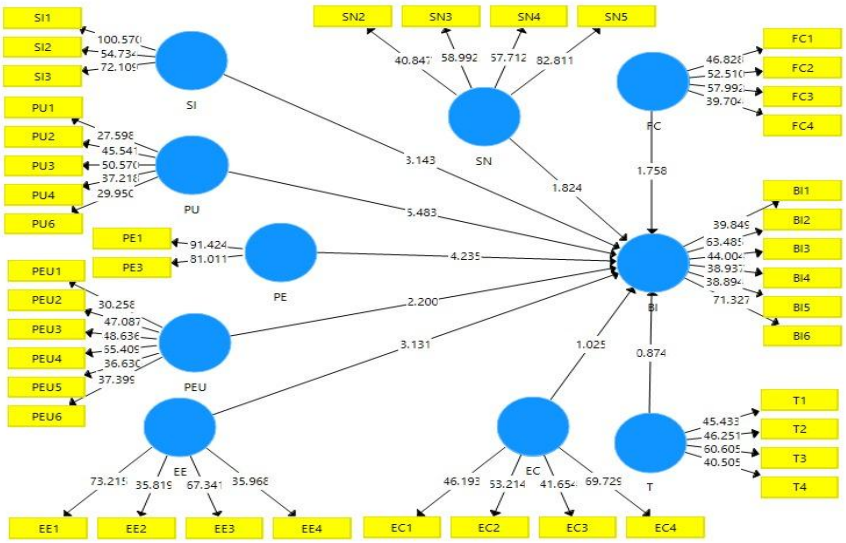

Figure 2: Structural Model.

In summary, EEPE, Perceived Usefulness (PEU), Perceived Usefulness (PU), SI, and BI to Adopt Smart Contracts in Trade Finance (BI) are all hypothesised to have notable positive associations. This study provides evidence to support these hypotheses. Despite this, the hypotheses of EC, FC, SNs (SN), and Trust (T) have been disproved since the links lacked statistical significance.

DISCUSSION

The results indicate a statistically substantial positive correlation between the EE and the BI to embrace smart contracts. This result is consistent with prior studies that emphasize the significance of user-friendly interfaces and simplicity of interaction in the adoption of technology. When seeking to encourage the widespread usage of smart contracts, banks should prioritise the improvement of user-friendly features on their platforms. The research findings provide evidence for a favourable correlation between PE and the BI to embrace smart contracts. This implies that the perceived advantages and use of smart contracts have a significant influence on the desire to embrace them. Policymakers and industry stakeholders may prioritise the communication and promotion of the concrete benefits correlated with the use of smart contracts to facilitate widespread acceptance.

The findings suggest a statistically significant and positive correlation between the perceived usefulness of smart contracts and the BI to embrace them. This highlights the significance of people seeing the practical value in embracing smart contracts. Increasing the adoption rates of smart contracts might be facilitated by providing stakeholders with comprehensive education on the actual benefits and practical uses associated with this technology. The research findings provide evidence of a statistically significant and positive correlation between the perceived usefulness of smart contracts and the BI to embrace them. This highlights the significance of perceived usefulness in influencing the desire to adopt. To enhance their attractiveness to potential users, organisations must prioritise the exhibition of the pragmatic benefits associated with smart contracts.

The conclusions indicate a statistically significant and positive correlation between SI and the BI to use smart contracts. This implies that the intention to adopt is affected by external factors and competitive forces. Policymakers and business leaders have the potential to utilise social dynamics to promote and facilitate the general adoption of certain practises or technologies. In contrast to initial hypotheses, the present study did not identify a statistically significant association between EC and the BI to embrace smart contracts. The findings of this study present a counterargument to the prevailing notion that environmental factors have a real influence on the adoption of smart contracts in the domain of trade finance.

The findings indicate that there is not a statistically substantial correlation between FC and the BI to embrace smart contracts. This implies that, notwithstanding the existence of advantageous circumstances, other variables may exert a more significant impact on the inclination to embrace. The research findings indicate a lack of statistically

significant correlation between SNs (SN) and the BI to embrace smart contracts. This assertion calls into question the notion that societal norms have a extensive effect on an individual's inclination to embrace smart contracts. In contrast to anticipated outcomes, the research did not reveal a statistically significant correlation between Trust (T) and the BI to embrace smart contracts. The obtained outcome poses a challenge to the prevailing notion that trust plays a pivotal role in modeling the acceptance and implementation of smart contracts within the domain of trade finance.

CONCLUSION

While identifying the barriers to the adoption of smart contracts for trade finance, it was discovered that, the users' behavior is extremely important. This is the user's traditional mindset, which compels them to continue with outdated methods of conducting business. However, the convenience and security associated with the new technology of smart contract are capturing the attention of trading partners. If not now, the advancements of blockchain will replace the traditional financing methods within the next ten to twenty years in Pakistan. It should be emphasized that in Pakistan, where businesses primarily rely on conventional financial framework, many SMEs are seeking emerging technologies to obtain a competitive advantage. However, the ratio of such business is low.

Globally, digitalization has mostly supplanted traditional means of providing financial services and products. The novel waves of digitalization are taking up more and more space in the business markets, creating new forms of payments and multiple applications for customers, partners, and other all over the world bringing people closer together through online and different network processes and platforms that allow them to act in real-time around the clock. It has been assessed from the responses collected, that few businesspersons have employed smart contracts for trading. However, it is pertinent to mention here that people value updated services, and it is crucial to recognize that if established financial providers do not offer such technical applications, it will lead to the emergence of new digital platforms offering technologies which ensures competitive advantage for the traders. To adopt such advanced technology the legal and regulatory framework of Pakistan poses multiple lacking.

Theoretical Implications

This study's theoretical implications contribute to the advancement of knowledge on the intricacies associated with the adoption of smart contracts. The observation of a correlation between EE, PE, Perceived Usefulness (PEU), and SI and BI is consistent with existing theories on technology adoption. Nevertheless, the dismissal of theories pertaining to EC, FC, SNs (SN), and Trust (T) poses a significant challenge to prevailing beliefs. The statement necessitates a reassessment of theoretical frameworks within the realm of smart contract implementation, emphasising the importance for academics to consider industry-specific intricacies and the ever-changing technical environment.

Practical Implications

The study's practical implications provide valuable insights that may be utilised by industry practitioners, regulators, and organisations engaged in trade financing and the deployment of smart contracts. Strategies Focused on User-Centric Approaches: Enhancing adoption rates may be achieved by designing user-friendly interfaces and communication tactics that prioritise the practical advantages of smart contracts. It is imperative for practitioners to give utmost importance to user experience and effectively communicate the benefits associated with the integration of smart contracts into trade finance operations. For Pakistan, where the technology is still in its infancy, a proper infrastructure and commitment to IT growth are also needed. Such commitment and continual growth in IT infrastructure enables consumers to make sound judgements.

The use of social dynamics for strategic advantage. Policymakers and business leaders can utilise social dynamics and competitive forces to establish a favourable climate for the widespread adoption of smart contracts. Efforts aimed at promoting collaboration, competitiveness, and social influence within the sector have the potential to enhance the overall adoption of smart contracts on a larger scale. Focused Education: It is imperative to provide stakeholders with comprehensive knowledge on the concrete advantages and practical uses of smart contracts, particularly in relation to their PU and expected performance. Training programmes and awareness efforts have the potential to mitigate the disparity between individuals' views and the tangible benefits provided by smart contract technology.

FURTHER DIRECTIONS

This study provides insights into the intricate aspects of smart contract adoption in the field of trade finance. We have studied the behavioural challenges in depth and pointed out that the convenience attached with the features of the smart contract attracts the consumer. However, it is important for researchers and practitioners to acknowledge the limitations of this study and remain dedicated to continuous exploration and adaptation as both the technology and industry landscape progress. Researchers must explore the legal complexities of adopting the smart contract. The legal guidelines for smart contract are limited in Pakistan. Researchers could investigate more about the structural changes to bring world global trading parties on one platform. Furthermore, to determine the extent of competitive advantage associated with the application of cutting-edge blockchain-based technologies in trade finance, a cost and benefit analysis as well as an analysis of the switching costs from conventional export financing methods to smart contract led trading methods must be conducted.

REFERENCES

Aikio, S. (2018). *Blockchain Technologies and Trust Formation in Trade Finance* (Master's thesis, University of OULU).

Allison, I. A. (2017, 05 March). *IBTIMES*. Blockchain. https://www.ibtimes.co.uk/maersk-ibm-aim-get-10-million-shipping-containers-onto-global-supply-blockchain-by-year-end-1609778

Antova, I., & Tayachi, T. (2019). Blockchain and smart contracts: A risk management tool for Islamic finance. *Journal of Islamic Financial Studies, 5*(1), 29-45.

Bakar, N. A., Rosbi, S., & Uzaki, K. (2017). Cryptocurrency framework diagnostics from Islamic finance perspective: a new insight of Bitcoin system transaction. *International Journal of Management Science and Business Administration, 4*(1), 19-28.

Blidholm, G., & Johnson, M. (2018). *The adoption of distributed ledger technology in trade and export finance operations of Swedish banks* (Degree Project, KTH, School of Industrial Engineering and Management (ITM), Industrial Economics and Management).

Chang, S. E., Chen, Y. C., & Wu, T. C. (2019). Exploring Blockchain Technology in International Trade: Business process Re-engineering for Letter of Credit. *Industrial Management & Data Systems, 119*(8), 1712-1733.

Chin, W. W. (1998a). Commentary: Issues and Opinion on Structural Equation Modeling. *MIS Quarterly, 22*(1), 7-16.

Chin, W. W. (1998b). The Partial Least Squares Approach to Structural Equation Modeling. In *Modern Methods for Business Research* (pp. 295-336). Lawrence Erlbaum Associates.

Civelek, M. E., & Özalp, A. (2018). Blockchain Technology and Final Challenge for Paperless Foreign Trade. *Eurasian Academy of Sciences Eurasian Business & Economics Journal, 15*, 1-8.

EU-Startups.com. (2017). *we.trade*. EU-Startups.com. https://www.eu-startups.com/directory/we-trade

Fornell, C., & Cha, J. (1994). Partial Least Squares. In R. Bagozzi (Ed.), *Advanced Marketing Research* (pp. 52-87). John Wiley & Sons.

Gagnon, M. P., Orruño, E., Asua, J., Abdeljelil, A. B., & Emparanza, J. (2012). Using a modified technology acceptance model to evaluate healthcare professionals' adoption of a new telemonitoring system. *Telemedicine and e-Health, 18*(1), 54-59.

Garg, R. (2022). Ethereum based smart contracts for trade and finance. *International Journal of Economics and Management Engineering, 16*(11), 619-629.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis*. Upper Saddle River, NJ: Pearson Prentice Hall.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice, 19*(2), 139-152.

Ham, M., Jeger, M., & Frajman Ivković, A. (2015). The role of subjective norms in forming the intention to purchase green food. *Economic research-Ekonomska istraživanja, 28*(1), 738-748.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*, 115-135.

Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural equation modelling: guidelines for determining model fit. *Electronic Journal of Business Research Methods, 6*(1), 53–60.

Hu, Y. C., Lee, T. T., Chatzopoulos, D., & Hui, P. (2020). Analyzing smart contract interactions and contract level state consensus. *Concurrency and Computation: Practice and Experience, 32*(12), e5228.

Labadi, H., & Khelil, A. (2022). How Blockchain Technology could reshape the Financial Industry. *Journal of Economic Growth and Entrepreneurship, 5*(4), 18-28.

Lawal, I. M. (2019). The suitability of cryptocurrency in the structure of Islamic banking and finance. *Journal of Regional Financing and Development Perspectives, 6*(6), 639-648.

Lennon, M., & Folkinshteyn, D. (2016). Braving Bitcoin: A technology acceptance model (TAM) analysis. *Journal of Information Technology Case and Application Research, 18*(4), 220-249.

Li, H., & Lai, V. S. (2005). Technology acceptance model for internet banking: an invariance analysis. *Information & Management, 42*(2), 373-386.

Lohmöller, J. B. (1988). Latent variable path modeling with partial least squares. *Multivariate Behavioral Research, 23*(1), 125-127.

Mao, D., Hao, Z., Wang, F., & Li, H. (2018). Innovative blockchain-based approach for sustainable and credible environment in food trade: A case study in Shandong Province, China. *Sustainability, 10*(9), 3149.

Mat Rahim, S. R., Mohamad, Z. Z., Abu Bakar, J., Mohsin, F. H., & Md Isa, N. (2018). Artificial Intelligence, Smart Contract and Islamic Finance. *Asian Social Science, 14*(2), 145.

Moonsamy, D. (2020). Blockchain Readiness for Countries towards 2030-The barriers and benefits of adopting Bockchain Technology.

Mougayar, W. (2016). *The business blockchain: promise, practice, and application of the next Internet technology*. John Wiley & Sons.

Onaolapo, S., & Oyewole, O. (2018). Effort Expectancy and Facilitating Conditions as Factors Influencing Smart Phones Use for Mobile Learning by Postgraduate Students of the University of Ibadan. *Interdisciplinary Journal of e-Skills and Lifelong Learning, 14*, 95-115.

Parmentola, A., Petrillo, A., Tutore, I., & De Felice, F. (2022). Is blockchain able to enhance environmental sustainability? A systematic review and research agenda from the perspective of Sustainable Development Goals (SDGs). *Business Strategy and the Environment, 31*(1), 194-217.

Peterson, R. A., & Kim, Y. H. (2013). On the relationship between coefficient alpha and composite reliability. *Journal of Applied Psychology, 98*(1), 194-198.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers, 36*, 717-731.

Ramayah, T. Y. J. A., Yeap, J. A., & Ignatius, J. (2013). An Empirical Inquiry on Knowledge Sharing Among Academicians in Higher Learning Institutions. *Minerva, 51*, 131-154.

Ringle, C., Da Silva, D., & Bido, D. (2015). Structural equation modeling with the SmartPLS. *Brazilian Journal of Marketing, 13*(2), 18.

Shmueli, G., Ray, S., Estrada, J. M. V., & Chatla, S. B. (2016). The elephant in the room: Predictive performance of PLS models. *Journal of Business Research, 69*(10), 4552-4564.

Stibe, A., Röderer, K., Reisinger, M., & Nyström, T. (2019). Empowering sustainable change: emergence of transforming wellbeing theory. In *In 14th International Conference on Persuasive Technology (Persuasive 2019)* (pp. 51-55). Limassol, Cyprus.

Taxiarchis, V., & Kasanda, M. (2019). *Comparative Analysis of Blockchain Technologies for Data Ownership and Smart Contract Negotiation* (Master's Thesis, University of Gothenburg).

Tenenhaus, M., Vinzi, V. E., Chatelin, Y. M., & Lauro, C. (2005). PLS path modeling. *Computational statistics & data analysis, 48*(1), 159-205.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46*(2), 186-204.

Warkentin, M., Shropshire, J., & Johnston, A. (2007). The IT security adoption conundrum: An initial step toward validation of applicable measures. *AMCIS 2007 Proceedings*, 276.

Xu, Z. Q. J. (2022). *Application & Security of Smart Contract in Financial Industries*. SWINBURNE University of Technology.