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# The Impact of Cloud Computing on Financial Data Security and Compliance in Financial Institutions

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## ABSTRACT

Cloud computing has been a revolution in the financial sector, where it offers scalable, secure, and cost-effective solutions that can address the rising demands of data management and regulatory compliance. Despite its global implications, empirical research does not exist on the impact of cloud adoption on security, compliance, and business performance in financial institutions in developing economies. The research paper is going to analyze the effect of the adoption of cloud computing on the financial data security, regulatory compliance, and business performance in Pakistani financial institutions, where the Technology Acceptance Model (TAM) is used as a theoretical approach to the research. According to a quantitative research design, data on 205 IT professionals, managers, and employees in banks and financial institutions were collected by using structured questionnaires, which were customized by the use of validated scales. Measurement and structural models were assessed with the help of Partial Least Squares Structural Equation Modeling (PLS-SEM). The results show that the applicability of cloud computing has a positive impact on the security of financial information, the growth of regulatory compliance, and business performance. These findings suggest that, besides increasing operational efficacy, cloud technologies are also providing basic cybersecurity and

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compliance support that is valued for the consistency and trustworthiness of financial institutions. The study advances the theoretical understanding of TAM by extending its implications to the post-adoption outcomes in the security-sensitive conditions and gives meaningful implications to the practitioners and policy makers who may want to promote secure digital transformation. The greatest implications indicate the need to have cloud governance policies, safe investments in cloud infrastructure, and the improvement of regulatory frameworks to enable responsible use of technology. Longitudinal studies, cross-country studies, and the incorporation of mediating variables along with moderating ones, such as trust, perceived risk, and digital readiness, are the research recommendations of the future.

**Keywords:** Cloud Computing Adoption, Financial Data Security, Regulatory Compliance, Non-Bank Financial Institutions.

## 1.Introduction

Non-bank financial institutions (NBFIs) are a vital part of the financial system of Pakistan that supplements the banking sector by offering diversified financial services, including leasing, microfinance, housing finance, investment management, insurance, and lending to underserved markets (Competition Commission of Pakistan, 2023; Naeem, 2023; Shaikh et al., 2025). Although NBFIs have facilitated greater financial inclusion and the promotion of small enterprises, they are severely challenged in terms of operation, technology, and regulation, which hinder their growth and reduce their capacity to deliver financial services in a secure, efficient, and compliant manner. NBFIs still have very old legacy systems, disjointed digital infrastructures, and manual record-keeping systems, which expose them to vulnerabilities in their operations and efficiency in their services (Abudaqqa, 2025; Naeem et al., 2025). One of the significant issues that Pakistani NBFIs face is their insufficient investment in sophisticated information systems, which limits their opportunities to enhance cybersecurity, ensure proper financial accounting, and fulfil the emerging regulatory requirements regarding data privacy and financial reporting (Pathan et

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al., 2017; Sial et al., 2025). Cloud computing comes out as a game-changing solution to NBFIs as it provides scalability and cost-efficient technological infrastructure without huge initial IT costs. Cloud-based systems help NBFIs to improve their digital operation, protect their financial data, automate compliance, and improve their service delivery by means of flexible pay-as-you-go models (Tehrani and Shirazi, 2014; Oliveira et al., 2014; Shahab et al., 2025).

Despite the advantages of cloud computing as experienced in the financial services industry in the world, there is still a paucity of empirical evidence regarding the impact of the adoption of cloud computing on key institutional performance measures in the environment of NBFIs in the developing economy of Pakistan, i.e. financial data security, regulatory compliance, and organizational performance (Pathan et al., 2017; Abudaqqa, 2025; Mahmood et al., 2025). Most of the literature that has addressed cloud adoption in Pakistan has been on commercial banks or generic SMEs, and frameworks like innovation diffusion theory and technology-organization-environment paradigm have been applied. Still, the applicability of TAM in NBFIs has been under-researched (Tehrani and Shirazi, 2014). Moreover, NBFIs in Pakistan are not digitally transformed, and most of the institutions are unable to enact secure, automated, and integrated information systems to perform modern financial operations (Strategic Policy Needed, 2024). The correlation between financial data security and cloud computing adoption is particularly critical, as NBFIs operate sensitive customer data, credit histories, investment data, and microfinance portfolios, and are under the increasing cybersecurity risks and threats of data leakages (Bitlinks Tech, 2025). In the same manner, the compliance aspect is under-researched, although NBFIs are under tough regulatory policies of the Securities and Exchange Commission of Pakistan (SECP), such as risk management policies, reporting policies, data storage policies, and cybersecurity policies. Most NBFIs do not have the internal capabilities to address these demands, and cloud services can represent a potential avenue to enhance compliance monitoring and accuracy of reporting (Competition Commission of

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Pakistan, 2023). To fill these gaps, this paper examines the impact of cloud computing adoption on financial data security, regulatory compliance, and business performance in Pakistani NBFIs using the TAM to evaluate the cognitive and behavioral processes that influence cloud computing adoption.

The current research is especially pertinent to NBFIs since they are a highly promising but fragile segment of the financial industry that requires a digital transformation to stay afloat and appropriate in the fast-changing Pakistani financial landscape (Strategic Policy Needed, 2024). The key obstacles facing NBFIs include low levels of digital abilities, low awareness of cybersecurity, poor documentation services, and low practices of IT governance barriers that cloud computing is specifically created to do away with (Katua et al., 2020; Pathan et al., 2017). In Pakistan, where the digital infrastructure is growing, the internet penetration is over 125 million subscribers, and the government is working to advance the idea of digital financial services, the conditions are favorable to the introduction of NBFIs to cloud-based solutions (Bitlinks Tech, 2025). The research questions that are being solved in the study are as follows: (1) What impact does the adoption of cloud computing have on the financial data security in NBFIs? (2) How much does the adoption of cloud computing facilitate regulatory compliance in NBFIs? (3) How does the adoption of cloud computing affect the outcomes of business performance at NBFIs? The corresponding research objectives are: (1) to investigate how cloud computing adoption impacts the financial data security of NBFIs; (2) to investigate the effect of cloud computing adoption on the regulatory compliance of adherence; and (3) to investigate the effect of cloud computing adoption on the performance of the NBFIs, including operational efficiency, reduction of costs, and competitiveness (Oliveira et al., 2014; Pathan et al., 2017).

The Technology Acceptance Model (TAM) has been adopted to give a conceptual underpinning to this study as it helps in explaining how individuals and institutions adopt and use new technologies in terms of perceived usefulness and perceived ease of use

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(Davis, 1989; Venkatesh, 2000). TAM is especially applicable to NBFIs since the decision-makers evaluate cloud computing in terms of its practical value, which includes better data protection, lower IT expenses, making it easier to comply with regulations, and operational performance. The predictive power of TAM renders it an appropriate instrument to examine technology adoption in financial organisations where security issues, regulatory pressure, and organisational preparedness have a high impact on the adoption behaviour (Marangunić and Granić, 2015). TAM2 and TAM3 extensions include other constructs like trust and perceived risk, which is why they were particularly relevant to NBFIs, as they work in high-risk and compliance-intensive settings (Shrestha and Vassileva, 2021). Therefore, TAM offers a strict theoretical framework to describe the adoption decisions and the impact of the NBFIs' perceptions of cloud computing on the security, compliance, and performance results.

It uses a deductive approach and positivist paradigm to test the hypothesis relationship of variables with the help of quantitative data gathered with managers, IT officers, compliance executives, and decision-makers who work in leasing companies, microfinance firms, modarabas, investment firms, and insurance firms, all based in Pakistan (Saunders et al., 2019; Creswell and Creswell, 2018). The questionnaire, which had undergone a validation process, was applied in a structured manner, where purposive sampling was used, which then yielded 216 respondents whose replies were usable. The analysis of data was performed by means of the Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0 and included two steps of data analysis: measurement model and structural model (Hair et al., 2021; Ringle et al., 2020). The study has three contributions: (1) the theoretical one is that it tests TAM on the under-researched context of NBFIs and contributes to the application of the model to security and compliance-driven organizations; (2) the methodological one is that it uses PLS-SEM to develop strong empirical evidence on the outcomes of cloud adoption; and (3) the practical contribution is that it provides the scientists with actionable insights on how NBFI managers, policymakers, SECP regulators,

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and cloud service provider can strengthen their digital infrastructure, compliance system, and cybersecurity preparedness This study will ease the misperceptions and perceived risks against using technologies by proving the value of cloud computing in enhancing financial data security and regulatory compliance among the NBFIs of Pakistan.

## 2. Theoretical Framework

The adoption of cloud computing within financial institutions can be articulated using the theories in the field of information systems, organizational behavior, and technology management. In all these areas of research, there is a focus by researchers on organizational requirements, perceived risks, regulatory forces, and expected performance benefits influencing the adoption of technology (Oliveira et al., 2014; Maroufkhani et al., 2020; Naeem et al., 2025a,b). Cloud computing, when it comes to financial institutions, comes with some peculiarities due to the fact that banks and financial service providers deal with sensitive financial information, and security, privacy, and compliance become the key factors of acceptance behavior (Chakraborty et al., 2022). The diffusion of innovation theory, resource-based view, and theory of technology acceptance are theoretical perspectives that indicate that institutions will embrace the adoption of technologies when they believe that it will increase operational efficiency, data management, as well as the competitive advantage (Rogers, 2003; Barney, 1991). The capability of the financial institution to offer cybersecurity protection, comply with international compliance standards, and address operational risk, including a data breach or system failure, further influences the use of cloud computing among the financial institutions that operate in more regulated settings (Alharthi et al., 2017). Accordingly, an organizational, technological, and environmental combination gives a conceptual framework of how cloud computing can promote a better performance in terms of financial data security and compliance.

TAM, created by Davis (1989), would be particularly appropriate in explaining the adoption of cloud computing in financial institutions because it concentrates on how users

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perceive new technologies. TAM allows formulating the hypothesis that intention to adopt and use a technology is determined by two main beliefs, which are perceived usefulness and perceived ease of use, ultimately making a difference in the success of technology adoption by an organization (Davis, 1989; Venkatesh and Davis, 2000; Khan et al., 2024; Naeem et al., 2025c; Mujtaba et al., 2025a,b; Memon et al., 2025). Perceived usefulness in these financial institutions, where cloud usage remains a matter of concern about cybersecurity, data confidentiality, and regulatory compliance, is intimately associated with the attitudes that cloud platforms enhance financial data security and enhance encryption, and access control, and increase compliance monitoring (Shrestha and Vassileva, 2021). Similarly, perceived ease of use determines the attitude of the employees and IT managers to the idea that cloud systems could be added to the current financial applications without any excessive complexity or interruptive effects on the operations (Gangwar, 2018). Since a broadened version of TAM enables the use of external forces, including the sense of risk, trust, regulatory support, and organizational preparedness, the model is a potent tool of analysis to describe the impact of perceptions of security and compliance on cloud computing acceptance among financial institutions (Venkatesh et al., 2003; Ali et al., 2022; Farooq and Ahmad, 2023; Farooq et al., 2023). Based on that, TAM is the fundamental theory of the study as it connects technology perceptions to the real increase in financial data security and compliance management.

## 3. Literature Review

### 3.1 Cloud Computing Adoption

Cloud computing is the provision of computing services, storage, applications, software, and processing power through the internet in a pay-as-you-use model (Mell and Grance, 2011). Its use in financial institutions has increased at a high rate because of the scalability, flexibility, cost-effectiveness, and capacity to assist in data-driven decision-making (Gangwar, 2018). In the case of financial institutions, cloud computing is essential to modernize IT infrastructure, increase the resilience of operations, and provide state-of-the-

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art risk management and financial reporting with the help of advanced analytics (Chakraborty et al., 2022). Nevertheless, the choice of adoption is influenced by the issues of data security, privacy, compliance, reliability of vendors, and complexity of integrations (Alharthi et al., 2017). The Technology Acceptance Model holds that substantial adoption of cloud computing is a factor of perception of usefulness and ease of use to users where sensitive financial information is handled (Davis, 1989; Venkatesh and Davis, 2000). The adoption of cloud services by financial institutions is only partly realized in the events where the services are perceived to be provided with effective security measures and regulatory compliance advantages, and thus, cloud adoption has become a significant indicator of enhancing data protection and governance.

### 3.2 Financial Data Security

Financial data security is defined as the systems, policies, and technologies that ensure sensitive financial information, such as customer records, transaction history, and internal financial documents, is not accessed by unauthorized people, is not attacked by cyber-attacks, or data is not breached, or the systems fail (Shrestha and Vassileva, 2021). Data security is one of the foundations of operational integrity and customer confidence in financial institutions due to increased cybersecurity threats in the industry, including phishing attacks, ransomware, and financial fraud (Chakraborty et al., 2022). Cloud computing systems may also have sophisticated security controls, such as encryption, multi-factor authentication, and incessant monitoring of threats, which can support the security of financial data better than most institutions working alone (Hashizume et al., 2013). Regardless of these benefits, security issues are the main obstacle to cloud deployment, because financial institutions have to provide confidentiality, privacy, and adherence to regulatory standards, including Basel III, GDPR, and national legislation on cybersecurity (Alharthi et al., 2017). Therefore, the security implications of cloud adoption should be understood in the process of establishing the role of adoption in the modern financial system.

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### 3.3 Regulatory Compliance

The concept of regulatory compliance is the degree to which financial institutions comply with the legal, regulatory, and governance standards concerning data management, privacy, reporting, and operational controls (Islam et al., 2022). Financial institutions are regulated with stringent rules, such as anti-money laundering (AML) regulations, Know Your Customer (KYC) policies, cybersecurity policies, and financial reporting regulations (Basel Committee, 2021). Cloud computing has the potential to enhance the performance of compliance by automating the documentation processes, maintaining data storage in a secure way, providing audit trails, and providing real-time monitoring of transactions and system activities (Senyo et al., 2018). Furthermore, cloud service providers have also become compliance-driven with international standards of compliance like ISO 27001, SOC 2, and PCI-DSS, and provide financial institutions with compliance-ready infrastructures (Chakraborty et al., 2022). Nonetheless, the compliance risk due to the mismatches between regulatory frameworks, limitations on cross-border data transfer, and shared responsibility issues has been a critical issue when adopting cloud computing (Maroufkhani et al., 2020). Accordingly, compliance can be regarded as a key outcome variable to be considered when analyzing the effectiveness of cloud adoption.

### 3.4 Business Performance

Business performance can be defined as the financial and non-financial performance that reflects the efficiency of operations of an institution, satisfaction of customers, profitability, competitive advantage, and strategic development (Oliveira et al., 2014; Ali et al., 2022; Anser et al., 2024; Anser et al., 2025; Bohio et al., 2025; Shaikh et al., 2025b). A performance in the financial sector depends on technological innovation, the cost structure, speed of service delivery, and efficiency of risk management (Gangwar, 2018). Cloud computing can be used to boost business performance by saving costs of IT infrastructure, scaling of services, and real-time analytics to make financial decisions (Chakraborty et al., 2022). Moreover, digital services can be deployed faster, core banking operations are

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automated, disaster recovery is increased, and customer experiences are enhanced using cloud platforms and mobile and online banking systems (Islam et al., 2022). According to the literature, financial data security and compliance-related cloud-enhanced benefits may be converted into enhanced market credibility, reduced operational risk, and future performance increases (Senyo et al., 2018). Therefore, the area of business performance is one of the primary organizational advantages of using the cloud service.

### 3.5 Hypotheses Development

#### 3.5.1 Cloud-based adoption and Financial data security

It is also indicated in the literature to offer a high level of security measures: end-to-end encryption, intrusion detection systems, secure access control, and continuous vulnerability monitoring that contribute to the enhancement of data protection in financial institutions to a great degree (Hashizume et al., 2013; Shrestha and Vassileva, 2021). Although the issues of third-party access to information are still underrated, the practical experience indicates that in most cases, cloud service providers have more robust security than on-premises systems (Chakraborty et al., 2022). TAM states that the adoption of cloud technologies by financial institutions results in higher levels of financial data protection, provided that these institutions view the technology to help enhance data security. Thus, the use of cloud computing will have a positive impact on the security of financial information.

*H1: The use of cloud computing has a significant effect on the financial data security in financial institutions.*

#### 3.5.2 Adoption and Regulatory Compliance of Cloud Computing.

Cloud-based applications help financial institutions to address regulatory compliance by offering adherence-ready environments, automated audit histories, a safe data repository, and real-time observation features (Senyo et al., 2018). It has been reported in previous research that cloud technologies assist institutions with meeting data privacy legislations, industry regulations, and operational risks requirements by granting standard controls and combined compliance setups (Maroufkhani et al., 2020). In TAM, perceived usefulness

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affects adoption intention, which implies that managers would adopt cloud services in cases where they believe that they would have an effect on compliance efficiency. Therefore, the utilization of clouds will enhance compliance.

*H2: The adoption of cloud computing has a significant effect on regulatory compliance in financial institutions.*

### 3.5.3 Adoption of Cloud computing and Business performance

Cloud computing positively affects the business performance through the following aspects: decreases the operating costs, increases the IT scale, enhances the responsiveness of services, and supports the digital transformation initiatives (Oliveira et al., 2014). Research shows that the use of clouds enhances transaction processing efficiency and boosts the quality of customer service, and supports innovation in the delivery of financial services (Gangwar, 2018). Since TAM assumes that the perceptions of usefulness are the driving force behind technology acceptance, the institutions that will acknowledge the advantages of cloud computing regarding its performance will have a higher chance of adopting it and delivering better operational results. Thus, it is expected that cloud usage will improve the performance of businesses within financial institutions.

*H3: Adoption of cloud computing has a significant effect on the performance of financial institutions.*

## 4. Methodology

### 4.1 Research Philosophy

The research is based on the positivist research philosophy, which presupposes the objectivity of reality, which is observable and measurable using empirical research (Saunders et al., 2019). This philosophical position corresponds to the objective of the research to quantify the measurement of adoption of cloud computing on financial data security, regulatory compliance, and business performance in financial institutions. There was the use of a deductive research method, in which the hypotheses were based on the Technology Acceptance Model (TAM) and other existing literature and were subsequently

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put to test, through quantitative analysis (Creswell and Creswell, 2018).

### 4.2 Research Design

The quantitative, cross-sectional research design was selected, which made it possible to investigate the relationships between variables systematically at a given time. The researchers employed a questionnaire survey to collect the data regarding the employees and IT managers working in financial institutions, targeting decision-makers with the knowledge of cloud computing implementation, data protection, and compliance procedures. This design is quite common in technology adoption research and allows generalizing the findings to the financial industry (Hair et al., 2021).

### 4.3 Population and Sample

The sample will consist of employees, IT professionals, compliance officers, and managers of commercial banks, microfinance banks, Islamic banks, and non-bank financial institutions (NBFIs) in Pakistan. The respondents in this study were sampled using a purposive approach, which refers to directly focusing on respondents who are directly engaged with the cloud technology or one of the supervisory roles involving IT security, finance, or compliance. The sample consisted of 10 times the rule, and the statistical power analysis suggested by PLS-SEM (Hair et al., 2021). At least 150 answers had to be answered, but 230 questionnaires were given out, and 205 valid ones were received, which gave enough statistical power.

### 4.4 Data Collection Procedure

The online survey through email and institutional networks was used to deal with primary data. The respondents were told about the aims of the study, its confidentiality, and voluntary participation. The data collection process took six weeks, and follow-up reminders were used to create high response rates. All the responses were filtered by missing values and outliers before analysis.

### 4.5 Instrument Development

The survey tool was divided into five big sections: demographic, cloud computing

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adoption, financial data security and regulatory compliance, as well as business performance. The measurements were taken on a 7-point Likert scale that started at 1 = Strongly Disagree to 7 = Strongly Agree. The measurement items were based on the previous research (Venkatesh et al., 2003; Oliveira et al., 2014; Shrestha and Vassileva, 2021), which guarantees reliability and content validity. The analysis of data was carried out in the form of Partial Least Squares Structural Equation Modeling (PLS-SEM) through Smart PLS 4. PLS-SEM is the appropriate choice since it can deal with complicated models that have many dependent variables. It advocates reduced sample sizes. It has a few limitations on data normality (Hair et al., 2021).

## 5. Results

### 5.1 Measurement Model Assessment

#### 5.1.1 Indicator Reliability

Table 1 shows the outer loading in all the measuring items of the four constructs, indicating that the model has good indicator reliability. All values are above the recommended loading of 0.70, meaning that all the observed variables have a significant contribution to their respective construct. The loadings in Cloud Computing Adoption (CCA) fall within a range of 0.798 to 0.854, which suffices to establish that the indicators are always able to get the underlying construct of cloud adoption. Likewise, the Financial Data Security (FDS) has very strong loadings with values of 0.795 to 0.884, indicating that the items are very strong in the measurement of data protection practices of the institution. There is also a high reliability of the Regulatory Compliance (RC) construct, and the loadings used also range between 0.791 and 0.879, indicating that the indicators are effective in representing the processes of compliance within a financial institution. Lastly, Business Performance (BP) measures have a loading of between 0.801 and 0.876, with this assertion showing that all the items have a strong ability to measure the performance-based outcome of cloud adoption. All these findings are corroborated by the conclusion that all constructs are highly measured in terms of reliability and precision.

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Table 1: *Indicator Reliability (Outer Loadings)*

| Construct | Item | Loading |
|---|---|---|
| Cloud Computing Adoption | CCA1 | 0.812 |
| | CCA2 | 0.854 |
| | CCA3 | 0.798 |
| | CCA4 | 0.823 |
| | CCA5 | 0.841 |
| Financial Data Security | FDS1 | 0.867 |
| | FDS2 | 0.884 |
| | FDS3 | 0.821 |
| | FDS4 | 0.795 |
| | FDS5 | 0.832 |
| Regulatory Compliance | RC1 | 0.842 |
| | RC2 | 0.879 |
| | RC3 | 0.814 |
| | RC4 | 0.791 |
| | RC5 | 0.826 |
| Business Performance | BP1 | 0.801 |
| | BP2 | 0.876 |
| | BP3 | 0.827 |
| | BP4 | 0.843 |
| | BP5 | 0.819 |

### 5.1.2 Construct Reliability and Convergent Validity

The values of Cronbach Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) used in each construct are reported in Table 2 and are all above the recommended ones. The Alpha values of Cronbach lie between 0.880 and 0.903, which indicates that the items in each construct are highly internally consistent. Composite

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Reliability of 0.914-0.930 also testifies to the high reliability of the measurement model. The values of the AVE are between 0.680 and 0.728, indicating that every construct has enough variance captured by its indicators. All these findings support the assumption that the constructs exhibit a high level of convergent validity, i.e., the items within a single construct exhibit a high level of common variance, and the constructs measure the latent variables that they are intended to measure. In general, the measurement model is well specified and reliable.

Table 2: *Construct Reliability and Convergent Validity*

| Construct | Cronbach's Alpha | CR | AVE |
|---|---|---|---|
| Cloud Computing Adoption | 0.887 | 0.916 | 0.683 |
| Financial Data Security | 0.903 | 0.93 | 0.728 |
| Regulatory Compliance | 0.891 | 0.92 | 0.695 |
| Business Performance | 0.88 | 0.914 | 0.68 |

### 5.1.3 Discriminant Validity

Table 3 shows the Heterotrait-Monotrait Ratio (HTMT), which is used to evaluate the discriminant validity by measuring the uniqueness of constructs. All the HTMT values are below the conservative level of 0.90, with 0.649 between Cloud Computing Adoption and Financial Data Security being the highest. The remaining construct pairs of the HTMT values (between 0.558 and 0.611) demonstrate the constructs to be statistically different and have no conceptual overlap. These findings affirm that both constructs are used to measure distinct variables of cloud adoption outcomes in financial institutions. The acceptable HTMT ratios also confirm that the constructs are not dependent on each other, hence strengthening the construct model. Overall, the discriminant validity test shows that the constructs are well distinguished and can be predictively analyzed.

Table 3: *Discriminant Validity (HTMT)*

| Construct | CCA | FDS | RC | BP |
|---|---|---|---|---|
| Cloud Computing Adoption | | | | |

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| | | | |
|---|---|---|---|
| Financial Data Security | 0.649 | | |
| Regulatory Compliance | 0.602 | 0.583 | |
| Business Performance | 0.558 | 0.574 | 0.611 |

## 5.2 Structural Model Assessment

The discussion indicates that the effect of the application of cloud computing on the sphere of financial data security is positive and significant. This result confirms H1 and aligns with the previous study, which indicates the presence of such high-tier security practices as encryption, identity access control, and threat detection that are present in cloud services (Shrestha and Vassileva, 2021; Hashizume et al., 2013). Cloud systems are more secure than on-premise systems in terms of financial institutions, where confidentiality and integrity of data can be considered a key requirement. These results confirm that the TAM is selectively useful in enabling security-enhancing adoption. At that, cloud computing may turn out to be a good ally to the institutions that are concerned with minimising the risks of cybersecurity and making the most out of the safety of financial data.

The results affirm that the implementation of cloud computing helps in increasing the regulatory compliance capacity of the latter, and hence, H2 is proved. The cloud solutions also help the institutions to meet the regulatory requirements, risk management requirements (AML/KYC), and regulatory data retention requirements (Senyo et al., 2018; Islam et al., 2022). The digital records of compliance and real-time monitoring dashboards, and automated audit trail, enhance transparency and accuracy. This implies that the compliance and risk fees to financial institutions will be low in case they share the cloud. It is discovered that perceived usefulness to increase compliance is also increased after TAM regarding adoption intention and action.

These findings show that the overall impact of cloud computing on the performance of the business, which can be regarded as significant, is positive. The strengths of cloud solutions are the increased flexibility of the organization, cost-effectiveness of the business operation, real-time decision-making, and the provision of

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customer services (Gangwar, 2018; Oliveira et al., 2014). What this implies with respect to a financial institution is that the organization can process transactions quickly, guarantee quicker availability of services, and decrease expenditure on infrastructure in IT or competitive edge in the digital bank service. These results prove that cloud systems usage cannot be considered an improvement in IT, but a performance improvement plan. The large effect size repeats the applicability of cloud computing in the determination of the performance of financial institutions.

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Table 4: *Hypothesis Testing*

| Hypothesis | Path | β | t-value | p-value | Decision |
|---|---|---|---|---|---|
| H1 | CCA → FDS | 0.548 | 9.721 | 0.00 | Supported |
| H2 | CCA → RC | 0.512 | 8.634 | 0.01 | Supported |
| H3 | CCA → BP | 0.594 | 10.128 | 0.00 | Supported |

## 6. Conclusion

The paper has discussed the impact of the use of cloud computing on financial data security, regulatory compliance, and the performance of businesses in financial institutions, the theoretical framework of TAM. Its results are strong empirical evidence of how cloud computing is a revolutionary technology that can transform basic operational and security services in the financial industry. All three hypothesized relationships were estimated to be quite valid, and one can say that the adoption of the cloud is a critical factor in ensuring the improved data security of finances, compliance, and organizational performance. These findings confirm that the perceptions of cloud computing that are perceived to be safe, useful, and operationally efficient by financial institutions are what drive the behavior of acceptance, and that is what is transformed into measurable institutional benefits. The research article contributes to the constant debate about the topic of digital transformation in financial institutions by establishing that the use of cloud technologies contains more than the potential to save money. Instead, they are core to increasing the resilience of cybersecurity, meeting advanced regulatory requirements, and supporting the high-service requirements of current financial markets. Overall, this paper points out that cloud computing is not a mere IT decision, but rather a strategic requirement of financial institutions that want to compete, be efficient in their activities, and be risk-free in the digital era.

This paper extends the premise of TAM into the financial services sector and demonstrates its effectiveness in explaining the uptake of security-sensitive technologies such as cloud computing. The inclusion of the financial data security, compliance, and

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business performance as the outcome variables takes TAM to a new level of maturity beyond the traditional outcome of adoption, and it proves the potential of the perceived usefulness in becoming actual institutional gains. This contributes to the technology adoption literature in the financial sectors of the emerging economy. The outcome of the analysis of financial institutions suggests that cloud computing is a strategic solution to many of the ongoing problems: cyber threats, administrative expenses, and performance failures. IT decision-makers and managers need to factor in on prioritization of the use of cloud-based systems as one of the components of their digital transformation strategies. Such insights enable cloud service providers to come up with unique and secure financial sector solutions that are compliant. Another option that regulators and policymakers can consider is to enable cloud adoption using new regulatory frameworks, incentives, and cybersecurity rules that can encourage safe digital transformation. The results show that the national regulators, such as the State Bank of Pakistan, need to accelerate the cloud governance policies so that they do not lose their focus on the international standards. Formulating clear compliance models in cloud applications within financial institutions can accelerate digital innovation without reducing the safety and stability of the system. Public-private partnerships would also enable the establishment of a secure and compliant cloud integration across the financial sector.

Several restrictions should be mentioned. To begin with, the study was cross-sectional, thus making it impossible to be able to draw inferences regarding the causal relationship between cloud adoption and its long-term impact. Second, the data were collected using self-reported questionnaires, and this factor may have introduced bias in the answers or even given socially desirable answers, particularly on security practices.

Third, the sample was limited to local Pakistani-based financial institutions; hence might not be generalized to other nations and industries. Finally, the study focused on core constructs and did not mention the potential to have intermediate variables such as trust, perceived risk, or organizational preparedness, which may further detail the cloud adoption

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process. There are various ways in which the current findings can be applied to future research. Longitudinal research design can be included in the work of scholars to observe the impact of cloud adoption on financial data security and compliance in the course of time. The research could also be expanded to include more variables, such as perceived risk, trust in cloud vendors, cybersecurity culture, or digital readiness, to obtain a better definition of an adoption behavior. The effect of regulatory maturity discrepancies or digital infrastructure on the success of cloud adoption in the financial sphere internationally may also be studied in cross-country comparative studies. Finally, one more topic that could be further investigated in the framework of making the financial sector more resilient is how future cloud-based applications, such as AI-powered security analytics, blockchain-as-a-service, or hybrid cloud designs, can be leveraged.

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