

Security Culture in Commercial Banks: Employee Awareness, Training Effectiveness, and Compliance Behaviour in Tamil Nadu

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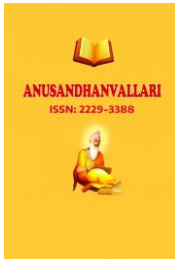
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Abstract

The increasing digitalization of banking operations has intensified security risks, making employee behaviour a critical component of organizational security frameworks. While technological safeguards are essential, their effectiveness largely depends on employees' awareness, training, and compliance with security policies. Against this backdrop, the present study examines security culture in commercial banks in Tamil Nadu, with a specific focus on the influence of employee security awareness and security training effectiveness on security compliance behaviour. The study adopts a quantitative, descriptive, and analytical research design and is based on primary data collected from employees of public and private sector commercial banks operating in Tamil Nadu. Data were gathered using a structured questionnaire measured on a five-point Likert scale. A multi-stage sampling approach was employed, and the final sample comprised bank employees with adequate exposure to security policies and training programs. The data were analysed using descriptive statistics, reliability analysis, correlation, and regression techniques. The findings reveal that employee security awareness has a significant positive influence on security compliance behaviour, indicating that informed employees are more likely to adhere to prescribed security norms. Further, security training effectiveness demonstrates a stronger and more significant impact on compliance behaviour, highlighting the role of practical and role-specific training in translating awareness into action. The combined analysis confirms that awareness and training jointly explain a substantial proportion of variation in employees' security compliance behaviour. The study contributes to the existing literature by providing region-specific empirical evidence on employee-centric security culture in the Indian banking context. Practically, the findings emphasize the need for commercial banks to strengthen continuous security awareness initiatives and invest in effective training programs to enhance internal security resilience and regulatory compliance.

Keywords: Security culture, employee security awareness, training effectiveness, compliance behaviour, commercial banks, Tamil Nadu



Introduction

The banking sector constitutes a critical pillar of economic stability and financial intermediation, where trust, confidentiality, and operational integrity are paramount. In recent years, commercial banks in India have undergone rapid digital transformation, integrating advanced information systems, electronic payment platforms, and data-driven decision processes to enhance efficiency and customer reach. While these advancements have significantly improved service delivery, they have simultaneously increased banks' exposure to operational, cyber, and compliance-related risks. Consequently, ensuring robust security practices has become a strategic priority rather than a purely technical concern (Bhasin, 2021).

Security in banking is no longer confined to physical safeguards such as surveillance systems, access control, and vault protection. Instead, it encompasses a broader organizational dimension commonly referred to as security culture, which reflects the shared values, awareness levels, attitudes, and behaviours of employees toward security policies and procedures (AlHogail, 2015). A strong security culture ensures that employees not only understand security protocols but also consistently comply with them in day-to-day operations. In contrast, weak security culture has been identified as a major contributor to security breaches, fraud incidents, and regulatory non-compliance in financial institutions (Herath & Rao, 2009).

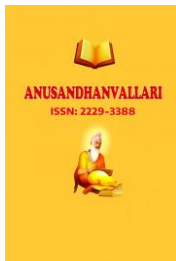
Employee awareness plays a central role in shaping security culture within banks. Bank employees act as the first line of defense against internal and external threats, including data leakage, phishing attacks, identity fraud, and procedural violations. Studies indicate that even sophisticated technological security systems can fail if employees lack adequate awareness or underestimate the consequences of non-compliance (Ifinedo, 2018). Awareness encompasses employees' understanding of security policies, recognition of threats, and knowledge of appropriate responses to security incidents. Therefore, assessing employee awareness provides critical insights into the effectiveness of security governance in banks.

Training effectiveness further strengthens security culture by translating awareness into consistent compliance behaviour. Regular and well-structured security training programs help employees internalize security norms, update their knowledge of emerging threats, and develop responsible security practices (Puhakainen & Siponen, 2010). However, empirical evidence suggests that many organizations focus on conducting training as a formal requirement rather than evaluating its actual effectiveness in influencing employee behaviour. In the banking context, ineffective training may result in procedural lapses, delayed incident reporting, and increased vulnerability to fraud and cyber risks.

Compliance behaviour represents the observable outcome of security culture, awareness, and training. It refers to the extent to which employees adhere to established security policies, regulatory guidelines, and internal control mechanisms. Compliance is particularly critical in the Indian banking system, which operates under stringent regulatory oversight by the Reserve Bank of India, emphasizing risk management, information security, and operational resilience. Non-compliance not only exposes banks to financial losses and reputational damage but also invites regulatory penalties and erodes stakeholder confidence.

Tamil Nadu represents an important regional context for examining security culture in commercial banks due to its dense banking network, high digital banking adoption, and diverse mix of public and private sector banks. Despite the region's advanced banking penetration, there is limited empirical research focusing on employee-centric security culture dimensions at the state level. Most existing studies are either technology-oriented or national in scope, offering limited insights into how employee awareness, training effectiveness, and compliance behaviour interact within specific regional banking ecosystems.

Against this backdrop, the present study seeks to fill this gap by empirically examining security culture in commercial banks in Tamil Nadu from an employee perspective. By focusing on awareness, training effectiveness,



and compliance behaviour, the study contributes to both academic literature and banking practice by identifying behavioural and organizational factors that strengthen internal security frameworks. The findings are expected to support bank management and policymakers in designing targeted training interventions and fostering a proactive security culture aligned with evolving risk environments.

Research Objectives

1. To analyse the level of security awareness among employees in commercial banks in Tamil Nadu.
2. To evaluate the effectiveness of security training programs in influencing employees' security-related understanding and preparedness.
3. To examine the impact of employee awareness and training effectiveness on security compliance behaviour in commercial banks in Tamil Nadu.

2. Literature Review

2.1 Security Culture in the Banking Sector

Security culture refers to the collective values, beliefs, and behavioural norms within an organization that shape how security is perceived, prioritized, and practiced by employees. In the banking sector, security culture has gained prominence due to increasing incidents of cyber fraud, insider threats, data breaches, and regulatory scrutiny. Prior studies emphasize that security culture is not merely a technological construct but a socio-organizational phenomenon driven largely by employee behaviour (AlHogail, 2015; Schlienger & Teufel, 2003).

Banks operate in high-risk environments where even minor lapses in employee conduct can lead to significant financial and reputational damage. Research indicates that institutions with a strong security culture experience fewer security incidents and demonstrate higher compliance with regulatory frameworks (Da Veiga & Eloff, 2010). Conversely, weak security culture has been linked to negligence, procedural violations, and resistance to security controls, especially among frontline banking employees (Siponen et al., 2014).

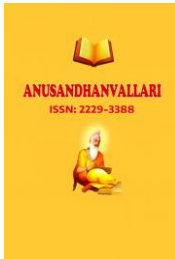
In the Indian context, security culture in banks is increasingly influenced by regulatory expectations set by the Reserve Bank of India, which emphasizes operational risk management, information security governance, and employee accountability. However, empirical research examining security culture from an employee perspective at the regional level remains limited, particularly in states with high banking density such as Tamil Nadu.

2.2 Employee Security Awareness

Employee security awareness is a foundational component of security culture and refers to employees' understanding of security policies, potential threats, and appropriate protective behaviours. Awareness determines how employees recognize risks such as phishing, unauthorized access, data misuse, and procedural non-compliance (Ifinedo, 2018).

Several studies highlight that lack of awareness among employees is a leading cause of security breaches in financial institutions, even when advanced technical safeguards are in place (Herath & Rao, 2009). Awareness influences employees' perception of threat severity and vulnerability, which in turn affects their willingness to follow security guidelines (Boss et al., 2015).

In banking environments, awareness is particularly critical due to frequent customer interactions, access to sensitive financial information, and reliance on digital platforms. Empirical evidence suggests that employees with higher security awareness demonstrate better judgment, proactive risk avoidance, and stronger compliance



behaviour (Ng et al., 2009). Despite its importance, awareness levels vary significantly across banks depending on organizational emphasis, communication practices, and managerial support.

2.3 Security Training Effectiveness

Security training is a primary organizational mechanism for translating awareness into consistent security behaviour. Training effectiveness refers not merely to participation in training programs but to the extent to which training improves knowledge, attitudes, and behavioural compliance among employees (Puhakainen & Siponen, 2010).

Research shows that frequent, role-specific, and practical security training enhances employees' confidence in handling security threats and increases adherence to security policies (Parsons et al., 2017). However, many organizations adopt a compliance-oriented approach to training, focusing on formal completion rather than behavioural outcomes. Such training often fails to influence real-world employee conduct (Vroom & von Solms, 2004).

In banking institutions, ineffective training has been associated with procedural errors, delayed incident reporting, and inadequate response to cyber threats. Studies emphasize that training effectiveness improves when programs are continuous, interactive, and aligned with employees' job roles (D'Arcy et al., 2009). Evaluating training effectiveness is therefore essential for understanding how security culture is internalized by bank employees.

2.4 Security Compliance Behaviour

Security compliance behaviour represents the observable manifestation of security culture and reflects employees' adherence to organizational security policies, regulatory standards, and ethical guidelines. Compliance behaviour is influenced by individual, organizational, and contextual factors, including awareness, training, perceived risk, and management support (Bulgurcu et al., 2010).

In the banking sector, compliance is critical due to strict regulatory frameworks governing data protection, financial transactions, and operational risk. Non-compliance not only increases exposure to fraud and cyber incidents but also results in regulatory penalties and erosion of stakeholder trust. Empirical studies consistently find that employees who perceive security policies as legitimate, useful, and well-communicated exhibit higher compliance behaviour (Siponen & Vance, 2010).

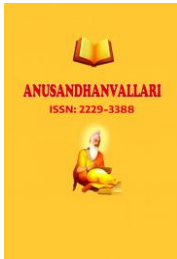
Despite extensive research on compliance in Western contexts, limited empirical studies focus on employee security compliance in Indian commercial banks, particularly at the state level. This gap highlights the need for region-specific evidence to inform managerial and policy interventions.

3. Theoretical Framework

The present study is grounded in **three complementary theories** to explain employee security behaviour in commercial banks.

3.1 Protection Motivation Theory (PMT)

Protection Motivation Theory explains how individuals adopt protective behaviours based on perceived threat severity, vulnerability, response efficacy, and self-efficacy (Rogers, 1975). In banking contexts, PMT suggests that employees who perceive higher security risks and believe in the effectiveness of security measures are more likely to comply with security policies. Security awareness and training enhance threat appraisal and coping appraisal, thereby strengthening compliance behaviour.



3.2 Theory of Planned Behavior (TPB)

The Theory of Planned Behavior posits that behaviour is driven by attitudes, subjective norms, and perceived behavioural control (Ajzen, 1991). Applied to banking security, TPB explains how employees' attitudes toward security policies, perceived organizational expectations, and confidence in their ability to comply influence actual compliance behaviour. Training effectiveness enhances perceived behavioural control, while awareness shapes attitudes toward security.

3.3 Organizational Security Culture Theory

Organizational Security Culture Theory emphasizes that employee behaviour is shaped by shared organizational values, leadership commitment, communication practices, and reinforcement mechanisms (Da Veiga & Eloff, 2010). In commercial banks, a strong security culture fosters normative pressure for compliance and embeds security as a routine aspect of work behaviour rather than an imposed obligation.

4. Conceptual Framework

Based on the literature and theoretical grounding, the study proposes a conceptual framework in which **employee security awareness** and **security training effectiveness** act as key antecedents of **security compliance behaviour**.

Conceptual Relationships

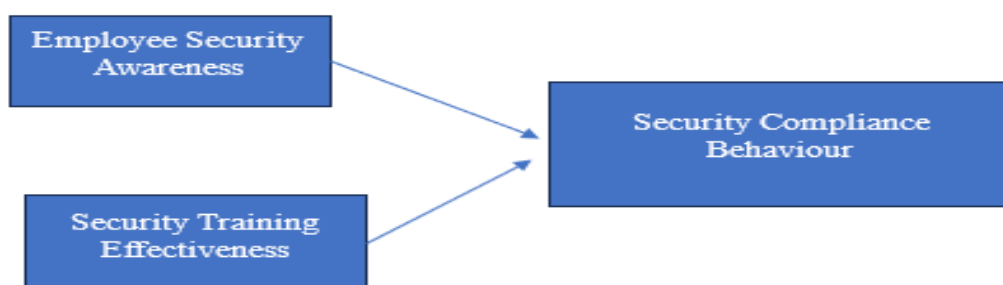
- Independent Variables
 - Employee Security Awareness
 - Security Training Effectiveness
- Dependent Variable
 - Security Compliance Behaviour

The framework assumes that higher awareness improves employees' understanding of security risks, while effective training strengthens skills and confidence, collectively leading to stronger compliance behaviour.

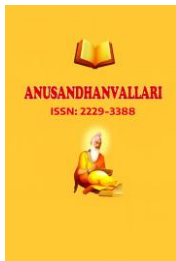
Proposed Conceptual Model

Employee Security Awareness →

Security Training Effectiveness → Security Compliance Behaviour



Source: Primary Data



Research Methodology

The present study adopts a quantitative, descriptive, and analytical research design to examine security culture in commercial banks, with specific reference to employee security awareness, training effectiveness, and compliance behaviour in Tamil Nadu. A quantitative approach is considered appropriate as it enables systematic measurement of employees' perceptions and behaviours and allows for statistical testing of relationships among the study variables using primary data.

The geographical scope of the study is confined to Tamil Nadu, a state characterized by high banking penetration, extensive digital banking adoption, and a balanced presence of public and private sector commercial banks. Bank branches located in major urban and semi-urban districts such as Chennai, Coimbatore, Madurai, Tiruchirappalli, Salem, and Tirunelveli are included to ensure representation of diverse operational environments. This regional focus enhances the practical feasibility of data collection while providing meaningful insights into state-level banking security practices.

The target population comprises employees of commercial banks in Tamil Nadu, including personnel from public and private sector banks. Employees with a minimum of six months of service in their current branch are considered eligible respondents, as such employees are expected to have adequate exposure to security policies, training programs, and compliance requirements. Frontline staff, operational employees, and supervisory personnel are included to capture varied perspectives on security culture within banks.

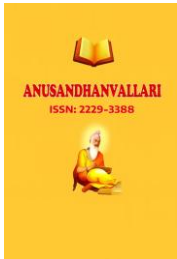
A multi-stage sampling approach is employed in the study. Initially, banks are stratified based on ownership type (public and private sector banks). Subsequently, branches are selected using a combination of convenience and quota sampling, considering accessibility and administrative permissions. Within selected branches, employees are chosen using purposive sampling, focusing on those involved in routine banking operations. This approach is practically suitable for banking research, where access constraints often limit the application of purely random sampling techniques.

Primary data are collected using a structured questionnaire administered to bank employees. The questionnaire is designed using a five-point Likert scale ranging from strongly disagree to strongly agree and includes items measuring employee security awareness, training effectiveness, and security compliance behaviour. The instrument is developed based on prior empirical studies and adapted to the banking context to ensure relevance and clarity. Data are collected through both offline distribution of questionnaires and online surveys, depending on branch accessibility and respondent convenience.

A pilot study involving thirty bank employees is conducted prior to the main survey to assess the clarity, reliability, and appropriateness of the questionnaire items. Feedback obtained from the pilot study is used to refine ambiguous statements and improve the overall quality of the instrument. Reliability of the constructs is assessed using Cronbach's alpha, with values of 0.70 and above considered acceptable for internal consistency.

Data analysis is carried out using SPSS, and where required, AMOS for advanced analysis. Descriptive statistics such as mean and standard deviation are used to assess the overall level of security awareness, training effectiveness, and compliance behaviour among bank employees. Inferential analysis includes correlation and multiple regression techniques to examine the influence of employee security awareness and training effectiveness on security compliance behaviour. For enhanced robustness, confirmatory factor analysis and structural equation modelling may be employed to validate the measurement and structural models.

Ethical considerations are given due importance throughout the study. Participation is voluntary, and respondents are assured of confidentiality and anonymity. No personally identifiable information is collected, and the data are used strictly for academic and research purposes. Informed consent is obtained from all participants prior to data collection, in accordance with accepted research ethics.



Hypothesis

H1: Employee security awareness has a significant influence on security compliance behaviour among employees of commercial banks in Tamil Nadu.

H2: Security training effectiveness has a significant influence on security compliance behaviour among employees of commercial banks in Tamil Nadu.

H3: Employee security awareness and security training effectiveness jointly have a significant influence on security compliance behaviour among employees of commercial banks in Tamil Nadu.

Data Analysis

DATA ANALYSIS AND INTERPRETATION

Influence of Employee Security Awareness on Security Compliance Behaviour

This session analyses whether the level of employee security awareness significantly influences security compliance behaviour among employees of commercial banks in Tamil Nadu. Security awareness is considered a critical behavioural factor that enables employees to recognize security threats and adhere to prescribed security policies and procedures. Understanding this relationship helps assess the role of awareness in strengthening organizational security culture.

Suggested Statistical Tool - Simple Linear Regression Analysis

Table 1: Regression Analysis – Security Awareness and Compliance Behaviour

Model	Predictor Variable	Beta (β)	t-value	p-value
1	Employee Security Awareness	0.482	9.214	0.000*

Source: Primary Data

$$R^2 = 0.232, F = 84.90, p < 0.001$$

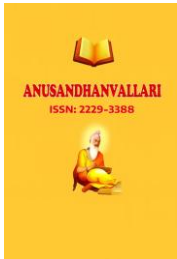
(Significant at 5% level)

Interpretation

The regression results reveal that employee security awareness has a significant and positive influence on security compliance behaviour ($\beta = 0.482, p < 0.05$). The R^2 value of 0.232 indicates that security awareness alone explains 23.2% of the variation in compliance behaviour among bank employees. This suggests that employees who possess higher awareness of security policies, threats, and procedures are more likely to comply with organizational security requirements. Therefore, the null hypothesis is rejected, confirming that security awareness plays a crucial role in fostering compliance behaviour in commercial banks in Tamil Nadu.

Influence of Security Training Effectiveness on Security Compliance Behaviour

This session examines the impact of security training effectiveness on security compliance behaviour among bank employees. Training effectiveness reflects the extent to which security training programs enhance employees' understanding, confidence, and ability to apply security practices in their daily operations. Evaluating this relationship helps determine whether training initiatives translate into actual behavioural compliance.



Suggested Statistical Tool- Simple Linear Regression Analysis

Table 2 : Regression Analysis – Training Effectiveness and Compliance Behaviour

Model	Predictor Variable	Beta (β)	t-value	p-value
1	Security Training Effectiveness	0.536	10.687	0.000*

Source: Primary Data

$$R^2 = 0.288, F = 114.20, p < 0.001$$

(Significant at 5% level)

Interpretation

The findings indicate that security training effectiveness has a strong and statistically significant impact on security compliance behaviour ($\beta = 0.536, p < 0.05$). The R^2 value of 0.288 shows that training effectiveness explains 28.8% of the variation in compliance behaviour. This implies that well-designed and relevant training programs significantly enhance employees' adherence to security protocols. The null hypothesis is rejected, demonstrating that effective security training is a key driver of compliance behaviour among employees in commercial banks in Tamil Nadu.

Combined Influence of Security Awareness and Training Effectiveness on Compliance Behaviour

This session evaluates the **combined effect** of employee security awareness and security training effectiveness on security compliance behaviour. Analysing both predictors simultaneously provides a comprehensive understanding of how cognitive awareness and skill-based training together contribute to strengthening security culture in banks.

Suggested Statistical Tool- Multiple Regression Analysis

Table 3: Multiple Regression Analysis – Awareness, Training, and Compliance Behaviour

Predictor Variables	Beta (β)	t-value	p-value
Employee Security Awareness	0.314	6.124	0.000*
Security Training Effectiveness	0.421	8.237	0.000*

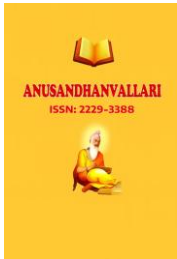
$$R^2 = 0.412, \text{Adjusted } R^2 = 0.407$$

$$F = 102.56, p < 0.001$$

(Significant at 5% level)

Interpretation

The multiple regression results show that both employee security awareness and security training effectiveness jointly and significantly influence security compliance behaviour. Training effectiveness ($\beta = 0.421$) exerts a stronger impact than security awareness ($\beta = 0.314$), indicating that practical training plays a dominant role in shaping compliant behaviour. The model explains 41.2% of the variance in compliance behaviour, highlighting the combined importance of awareness and training in strengthening security culture. Hence, the null hypothesis is rejected, confirming the joint influence of both factors on compliance behaviour in Tamil Nadu's commercial banks.



Findings of the Study

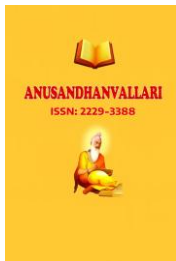
1. The study reveals that employee security awareness has a significant positive influence on security compliance behaviour in commercial banks in Tamil Nadu. Employees who are well-informed about security policies, cyber threats, and reporting procedures demonstrate higher adherence to prescribed security norms.
2. Security training effectiveness emerges as a stronger predictor of compliance behaviour compared to awareness alone. Employees who perceive security training programs as relevant, practical, and role-specific show greater consistency in following security protocols.
3. The combined analysis indicates that security awareness and training effectiveness jointly explain a substantial proportion of variation in security compliance behaviour, highlighting the interdependent role of knowledge and skill-based interventions in shaping security culture.
4. The findings suggest that training initiatives translate awareness into action, reinforcing the argument that security culture is strengthened when awareness programs are supported by continuous and effective training mechanisms.
5. The results also indicate that security compliance behaviour among bank employees is not solely driven by regulatory enforcement, but significantly influenced by internal organizational practices such as communication, training design, and employee engagement with security initiatives.

Suggestions of the Study

1. Commercial banks in Tamil Nadu should institutionalize continuous security awareness programs that regularly update employees on emerging cyber threats, fraud trends, and policy changes rather than relying on one-time orientation sessions.
2. Banks are advised to redesign security training programs to be more practical and role-specific, incorporating real-life case scenarios, simulations, and interactive modules that enable employees to apply security practices in their daily operations.
3. Management should integrate security compliance indicators into performance appraisal systems, encouraging employees to internalize security responsibilities as part of their professional accountability.
4. Periodic evaluation of training effectiveness should be conducted using feedback mechanisms and compliance audits to ensure that training outcomes translate into behavioural change.
5. Policymakers and regulators, including the Reserve Bank of India, may encourage banks to adopt employee-centric security governance frameworks that emphasize behavioural compliance alongside technological safeguards.

Conclusion

The present study examined security culture in commercial banks in Tamil Nadu by analysing the influence of employee security awareness and training effectiveness on security compliance behaviour. The findings confirm that both awareness and training play a significant role in strengthening compliance, with training effectiveness exerting a comparatively stronger impact. This highlights the importance of moving beyond technology-driven security approaches toward a holistic security culture that prioritizes employee behaviour. By emphasizing continuous awareness initiatives and effective training programs, commercial banks can enhance internal security resilience, reduce operational and cyber risks, and reinforce regulatory compliance. The study contributes to



banking security literature by offering region-specific empirical evidence and provides practical insights for bank management and policymakers seeking to foster sustainable security culture in the digital banking era.

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