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EXPLORING JUSTICE PERCEPTIONS IN ONLINE BANKING RECOVERY: GENDER MODERATION AND BEHAVIORAL OUTCOMES

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Abstract. The study addresses the recovery from service failures in online banking. It focuses on the three dimensions of perceived recovery justice – namely, distributive justice (DJ), procedural justice (PJ), and interactional justice (IJ) – and investigates their impact on post-recovery satisfaction (PRS), the moderating effect of gender, and further, the influences of PRS on customer trust (CT), affective commitment (AFFC), and customers' behavioral intentions (CBI). The study uses partial least squares structural equation modelling to examine the data collected in Egypt from 445 respondents who experienced a service failure with online banking. The results show that the three dimensions of perceived recovery justice – DJ, PJ, IJ – exert positive influences on PRS, and gender moderates the effects of PJ and IJ on PRS: procedural justice makes women exhibit higher levels of PRS. In contrast, interactional justice makes men encounter higher levels of PRS. The results also show that PRS positively influences CBI through its direct and indirect effects (via CT and AFFC). Furthermore, PRS mediates the positive effects of DJ, PJ, and IJ on customers' behavioral intentions. The study outcomes have significant theoretical and practical implications for online banking.

1. Introduction

Financial services have seen significant change with the advent of self-service technology, e-banking, and other tech-based banking efforts (Reis et al., 2019). Additionally, due to the advantages of the Fourth Industrial Revolution and the onset of the COVID-19 pandemic, it has become significant that banks must now offer e-service platforms to their customers (Rukasha et al., 2021). Hence, providing e-services is now considered a fundamental necessity for banks to be competitive in the market rather than a competitive advantage, and the competition among banks has broadened to include traditional banking as well as online banking and e-services (Nyagadza et al., 2022). However, service outages can harm the success of e-service platforms if they are not handled properly (Matikiti et al., 2018). In all service sectors, e-service failures are a typical occurrence.

Consequently, several system-related service interruptions, like technological malfunctions, system outages, and other problems of a similar nature that could affect the customer's experience, have been brought on by expanding technology-based processes (Azemi et al., 2019). Since the service provider cannot control many of these issues, implementing efficient service recovery procedures is essential for regaining customer trust.

The inevitability of challenges and issues in the operation of electronic banking services stems from variations in consumer expectations and the standards used to evaluate satisfaction with the service (Agolla et al., 2018). Therefore, banks must constantly monitor these technical systems to reduce the likelihood of such failures and guarantee their customers a seamless and effective service delivery process (Koc et al., 2019). Bank marketing managers must comprehend the cognitive and affective dimensions of customer satisfaction, as e-service delivery platforms significantly impact customer perceptions and intentions (Nyagadza et al., 2022). Furthermore, the quality of customers' relationships and their behavioral intents are significantly impacted by their assessments of the e-service recovery procedures employed by banks (Cheng et al., 2019). Consequently, restoring PRS and CBI has made effective service recovery strategies crucial because an e-service failure recovery gives banks a better chance to attract customers and strengthen their CBI. Thus, comprehending the recovery preferences of consumers can assist providers in formulating and executing strategies that correspond with customers' expectations and promote effective service recovery (Jin et al., 2020).

As a result, notwithstanding the progress made in studying the influence of post-recovery on customer behavior, more research is required to comprehend how perceived recovery justice (PRJ) affects PRS and relationship quality (RQ) behavior in the banking sector, particularly in Egypt, as no study has examined the link between these variables in the Egyptian banking sector. Furthermore, it should be noted that more research is necessary to understand why e-banking systems fail and what recovery tactics work. Thus, there is not enough research on the consequences and causes of e-service failure in banking on PRS, RQ and CBI, even though service failure, handling of complaints, and service recovery have been extensively studied in sectors like hotels, mobile phones, airlines, and retail (Chiou et al., 2021). Specifically, relatively little research has investigated the impact of PRJ dimensions on PRS and CBI. Certain scholars have concentrated on the mediating influence of PRS (cognitive element) in the link among PRJ and CBI, neglecting to address the affective aspects entirely (AFFC and CT). Consequently, CBI may be better explained by the customer's cognitive and affective assessment of service recovery initiatives. Similarly, and based on cognitive appraisal theory, we contend that a satisfactory evaluation of the service recovery attempt would reinforce customer AFFC and CT, establishing CBI in a service breakdown and recovery scenario. Surprisingly, previous research has yet to address this important gap. To illustrate our arguments, the link between PRS and CBI is mediated by consumer AFFC and CT, which studies have widely ignored.

This study has also established that gender significantly moderates the association between various aspects of PRJ and PRS. This constitutes a significant addition to the current body for study as most studies have either ignored or treated gender as a control variable. The prior research conducted by Karatepe (2011) indicated that gender influences the relationship between empathy and confidence on customer satisfaction within the banking sector; the present study examines the moderating role of gender in the setting of service recovery failures. Powell (1999) proposed in the social role and gender schema theories that personality differences between men and women explain their differing attitudes toward recovery strategies. Consequently, this research supposed that gender has a contingent impact

on the relationships between the three dimensions of PRJ and PRS. Intending to improve managers' practical application by providing insights into developing and implementing effective e-service recovery techniques, this study adds to the justice theory by using it to clarify the complexities of the e-banking service procedure.

2. Hypotheses formulation and study model

2.1. Online service failure and recovery in banking industry

The change in customer expectations and behaviors in the banking sector has led to a vital shift in their preferences, with online service becoming the primary way customers and service providers interact. As a result, the banking sector has been forced to move beyond old methods and increasingly use e-services to accommodate an expanding customer base and enhance profitability (Fonseca, 2014). Consequently, the utilization of the online service has resulted in multiple instances of service failures that are primarily caused by factors outside the service provider's direct control (Sim et al., 2021). Online banking service Failure transpires when a bank neglects to provide the services it has pledged to consumers, with any failure, whether fundamental or intricate in banking services, potentially leading to consumer losses (Singhal et al., 2013). Consequently, banking managers can execute suitable online service recovery plans by analyzing the correlation between consumer behavior and the magnitude of service failures. Hence, this can mitigate the principal sources of service failures in the banking sector, such as sluggish Internet banking, bureaucratic procedures, and issues within the ATM network (Azemi et al., 2019).

Therefore, these failures have resulted in a decrease in customers' impression of service quality, which has had a substantial influence on their overall satisfaction (Joireman et al., 2013). The most common instances of failure are linked to conventional technology-driven self-service alternatives Bouranta et al. (2019), often resulting in adverse emotional reactions, customer dissatisfaction, and potential defection (Piha & Avlonitis, 2015). Consequently, the growing dependence on technology-driven tools for providing services has worsened the incidence of service problems within the banking sector.

According to Hollebeek and Rather (2019) identified several common service failures in the banking sector, including machine and system problems, operational failures, informational errors, and delays in action. Hence, these failures significantly contribute to the overall situation. Consequently, online banking service failures frequently involve the mishandling of consumer inquiries, the inadequate disclosure of critical transaction information, and technology issues that originate from financial experts (Agolla et al., 2018). On the other hand, these online service failures can manifest in various ways, such as technical glitches, system outages, mobile app crashes, incorrect account balance displays, ATM network failures, and similar issues, all of which can substantially impact the consumer experience. As a result, banks must meticulously manage and monitor their technological systems to prevent malfunctions and guarantee a seamless and efficient service delivery process for their customers (Tarofder et al., 2016).

2.2. The relationship between PRJ and PRS

PRS is a customer's response to fulfilling their expectations, and previous studies have investigated how it relates to initiatives made by firms to recover from any service failures that may occur (Chao & Cheng, 2019). In this recovery context, perceived recovery justice can be an

essential factor affecting PRS (Ali & Mohamed, 2020). Thus, when a service failure happens, customers can think that justice isn't being delivered, which could harm PRS (Lambert et al., 2020). Additionally, research has demonstrated that the three dimensions of PRJ-DJ (Distributive justice), PJ (Procedural justice), and IJ (Interactional justice) – all have a significant impact on PRS (Muhammad & Gul-E-Rana, 2020).

Therefore, it has been demonstrated that using compensation and online resources and procedures such as FAQs, help pages, and corporate guidelines significantly influences PRS in online service recovery (Villi & Koc, 2018). Similarly, Ding and Lii (2016) investigated the link between PRS and fairness in an online service context. Thus, this research emphasized the significance of customers' perception of justice by examining how they perceived the three-justice components after their unsuccessful online service requests. Matikiti et al. (2018) verified that perceived recovery justice significantly influences PRS in the e-service failure context. For instance, implementing effective recovery procedures online can demonstrate to the customer that the company is acknowledging its mistakes and making the necessary corrections, which can assist in rebuilding trust and PRS (C.-C. Chang & Hung, 2018).

Moreover, Ali (2023) explored the connection between PRS and the PRJ dimensions of e-service recovery. According to this study, PJ had the most effects on PRS, followed by DJ, whereas IJ had no such impact. Migacz et al. (2018) stated that there is a mixed and inconsistent link between each of the three dimensions of perceived recovery justice and the PRS component. For instance, IJ and PJ both have a favorable impact on PRS, but DJ was less significant and less relevant. Thus, effective recovery of e-service failures can lead to higher levels of PRS. Therefore, this study hypothesized that DJ, PJ, and IJ play a crucial role in determining PRS. Thus, the following hypotheses will be formulated:

H1a. DJ positively influences PRS.

H1b. PJ positively influences PRS.

H1c. IJ positively influences PRS.

2.3. The relationship between PRS and CBI

The reciprocity norm (Gouldner, 1960) and social exchange theory can provide a valuable framework for comprehending the interaction between PRS and CBI in service recovery. Specifically, when a company responds to a customer's complaint, the customer may feel better about the company and be more inclined to reciprocate the goodwill by acting positively toward the company, such as recommending it to others, writing positive reviews, or showing greater brand loyalty (Albrecht et al., 2019). Consequently, Dandis and Wright (2020) assert that different behavioral outcomes may arise depending on how consumers react to service recovery and PRS. Therefore, these results might include their desire to spread the WOM about their experiences and loyalty (Putra & Putri, 2019).

Conversely, unsuccessful service recovery has increased dissatisfaction and led to plans to move to a different service provider (Wang & Huang, 2018). Prior studies conducted in online service recovery settings have repeatedly shown that PRS is a powerful predictor of service receivers' actions and the CBI (Ali, 2022). Additionally, service providers may learn which service recovery alternatives work best and adjust their recovery strategies appropriately for recovery satisfaction. Ultimately, satisfying consumer preferences for online service recovery may contribute to an enhanced consumer experience and help increase customers' behavioral intentions (Bouranta et al., 2019; Amoako et al., 2023). Moreover, according to

Kwon Choi et al. (2014), customers who express contentment with their service handling are inclined to maintain their patronage of the service provider and disseminate positive perceptions. Consequently, this suggests that a greater propensity to engage in a particular conduct increases the likelihood of its development, particularly among satisfied consumers who frequently show favorable behavior toward a brand or product. Thus, customers are more likely to spread good WOM marketing after receiving efficient service recovery and indicate they plan to purchase more. Thus, this research hypothesized that PRS is crucial in determining CBI. The following hypothesis will be formulated:

H2. PRS positively influences CBI.

2.4. The relationships between PRS and CT, and PRS and AFFC

According to the literature, CT and AFFC are the cornerstones of customer-bank relationships and are essential for the successful development of the banking sector (Skvarciany & Jurevičienė, 2017). Developing and preserving enduring relationships depend critically on sustaining high levels of CT and AFFC (Tahir et al., 2021). CT, often linked to service recovery, is determined by how the customer perceives the service provider's classification, dependability, honesty, and adherence to moral principles (Bakar et al., 2020). Thus, Ahmad et al. (2024) concluded that PRS negatively affects customer distrust. Along with the same, Matikiti et al., (2020) found that PRS levels considerably affected CT and AFFC. As a result, investigations conducted mainly in the services sector are included in this small body of research. For instance, Lai (2015) discovered that PRS enhances customer AFFC in the restaurant sector.

Likewise, within the tourism sector, Richard and Zhang (2012) demonstrate that PRS with a travel agency raises consumer AFFC to that agency in the travel agency. In a theatrical firm, Johnson et al. (2008) found that PRS positively influences AFFC. In addition, Bakar et al. (2020) proved that PRS is used to reevaluate its trustworthiness and that perceived trustworthiness results in a trusted customer, demonstrating the beneficial effects of PRS on CT. Additionally, when examining the consequences of PRS empirically, scholars often focus on behavior-related results variables, such as purchase intentions and customer loyalty (Brakus et al., 2009). Unexpectedly, though, there has not been much empirical connection between PRS and affective outcome factors such as consumer AFFC. As a result, this study hypothesized that PRS plays a circular role in determining CT and AFFC. Thus, the following hypotheses will be formulated:

H3. PRS positively influences CT.

H4. PRS positively influences AFFC.

2.5. The relationship between CT and CBI, and AFFC and CBI

Relationship quality reflects the customer's confidence in the service provider's capability to fulfill promises based on a consistent history of meeting past commitments (Olavarría-Jaraba et al., 2018). Higher levels of CT and AFFC are associated with enhanced relationship quality. These elevated CT and AFFC levels correspond to improved customer retention and CBI, leading to positive word-of-mouth (WOM). Additionally, ongoing relationships between customers and service organizations foster increased affective commitment. Abdullah et al. (2014) have further shown that customers' trust in a company is eroded when they perceive a lack of commitment and substandard quality. Thus, establishing CT and AFFC by maintaining excellent customer connections is significant in the service sector (Ha & Jang, 2009).

Thus, service providers with highly committed consumers are more likely to produce positive relationship quality with their customers and obtain favorable behavior from them due to previous positive experiences (Fernandes & Pinto, 2019). Consequently, this can partially stimulate their desire to shift to NWOM. Furthermore, Shirkhodaie and Rastgoo-deylami (2016) discovered a significant link between AFFC and favorable WOM and repurchased intent. Consequently, Garepasha and Aali (2020) indicate that CT significantly impacts consumers' WOM communication and propensity to repurchase. As a result, this study hypothesized that CT and AFFC play a crucial role in determining CBI. Thus, the following hypothesis will be formulated:

H5. CT positively influences CBI.

H6. AFFC positively influences CBI.

2.6. Mediating effects

Prior studies have investigated the correlation between PRJ and CBI, establishing that PRJ indirectly impacts CBI via PRS mediation (Ali, 2022). Therefore, consumers are more inclined to express satisfaction with the recovery result and to participate in positive behaviors toward the e-banking provider when they perceive a fair and reasonable service recovery procedure (Lu et al., 2020).

In the banking sector, PRS and CBI are related (Dandis & Wright, 2020). By enhancing PRS, banks can influence consumers' behavioral intentions or alleviate negative sentiments toward e-service failure (Rambocas et al., 2018). Along with the same, the findings of Abbasi et al. (2023) suggest that using perceived recovery justice to resolve complaints about online banking services results in heightened levels of PRS. Consequently, this may favor customers' intents, resulting in advantages such as heightened repurchase intentions and favorable WOM communication. Nevertheless, the mediator role of PRS in influencing CBI has not been substantially investigated in banking research (Ali et al., 2023). Conversely, it has been shown that PRS is the primary direct influence of guests repurchase intention within luxury and first-rate hotels, with CT serving as a mediator between these variables (Wilkins et al., 2009). Furthermore, an affectionate customer connection, AFFC, with a service provider may positively impact behavioral intentions because emotional attachment (AFFC) acts as resistance against moving to an alternative. As previously stated, the mediating role of relationship quality (CT and AFFC) might clarify the connection between PRS and CBI. Thus, drawing on emotional attachment theory (Bowlby, 1969; Perlman & Fehr, 1987), we investigate whether a recovery effort induces various post-recovery behavioral responses depending on the extent of a customer's CT and AFFC. Thus, considering the preceding discussion, the following hypothesis will be formulated:

H7a. PRS mediates the relationship between DJ and CBI.

H7b. PRS mediates the relationship between PJ and CBI.

H7c. PRS mediates the relationship between IJ and CBI.

H8. CT mediates the relationship between PRS and CBI.

H9. AFCC mediates the relationship between PRS and CBI.

2.7. Gender as a moderator between PRJ and PRS

Prior research has shown that ensuring equitable treatment without prejudice will increase customer satisfaction concerning service recovery. Furthermore, successful service recovery

fosters favorable customer conduct and increases their contentment with the company (Ibrahim et al., 2018). As a result, the relevance of gender differences has been highlighted in some research, including those carried out by Boo et al. (2013), further emphasizing the significance of perceived recovery justice for both genders. In essence, perceived fairness is equally essential for both genders but with distinct implications. Furthermore, according to the social role theory proposed by Powell (1999), females and males have different perspectives on the service recovery process. Consequently, this phenomenon is supported by the results of Cambra-Fierro et al. (2013), who concluded that gender could influence the link between PRJ dimensions and PRS.

Thus, the research demonstrates that when females are treated fairly, they create a good attitude toward the organization and feel a sense of positive relational justice, increasing their loyalty. On the other hand, men often need to be more committed and exacting. According to the gender schema theory proposed by Bem (1981), people's mental categorizations, thinking patterns, and the development of male and female attributes are all determined by their early cognitive development in conjunction with social influences. Consequently, individuals tend to interpret information by their gender-related attributes. Within the context of service recovery, females want to be acknowledged by representatives of the organization, given sufficient time to express their concerns, and entitled to appropriate compensation. Conversely, men emphasize the final result of the recovery process and downplay the significance of being heard (McColl-Kennedy et al., 2003). Finally, though fair treatment is essential for both genders, the conversation above implies that females could prioritize it more than males, leading to a higher level of PRS. Thus, the following hypotheses will be formulated:

H10a. The relationship between high DJ and PRS is moderated by gender, such that the effect is higher for females than males.

H10b. The relationship between high PJ and PRS is moderated by gender, such that the effect is higher for females than males.

H10c. The relationship between high IJ and PRS is moderated by gender, such that the effect is higher for females than males.

Figure 1 illustrates the relationship paths between the study variables, including both mediating and moderating effects.
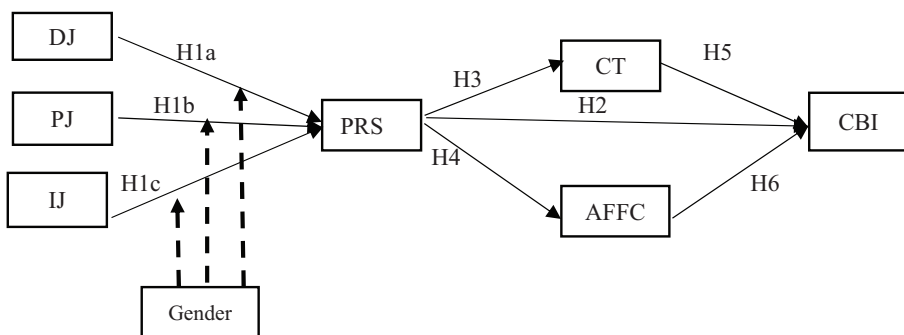

Figure 1. Proposed study model

3. Data collection and measures

A web-based survey was used in the Egyptian banking industry to investigate customer view-points about service disruption and recovery. The respondents were chosen using a purposive sampling technique, primarily targeting persons who have encountered e-service recovery in the banking sector. This technique was required due to the unpredictable nature of service failures and the need for individuals with relevant experiences. Therefore, three essential screening questions were utilized to guarantee that participants were of the desired target group: a) Participants were queried about their current banking affiliation with an Egyptian financial institution. b) Subsequently, participants were asked about using internet banking services. c) Then, the participants were inquired about any service-related issues or malfunctions encountered during their e-banking services. d) Participants were requested to indicate the service failure they encountered during their online banking encounter. Only participants who responded positively to the first three questions and shared a relevant experience of service failure were included in the study.

Furthermore, the respondents were chosen based on their explicit agreement to participate in the survey and their proven comprehension of the study's objective. In addition, participants were given guarantees of secrecy, and only those who acknowledged and agreed to these conditions were included. Respondents who demonstrated insufficient understanding of the investigation issue, as assessed by their responses to preliminary questions, were eliminated from the study. The web-based survey used a questionnaire to record participants' responses, graded from "strongly disagree (1)" to "strongly agree (5)" on a five-point Likert scale.

The measurement model comprised seven variables, each assessed through multi-item scales in the survey. Perceived Recovery Justice (PRJ) was evaluated using a total of twelve items across its three dimensions: DJ and PJ, each measured by four items adapted from del Río-Lanza et al. (2009), and IJ, measured by four items sourced Lin et al. (2011). Similarly, the rest of the constructs were adapted from literature: PRS, was assessed with four items from Lin et al. (2011); CBI, four items from Wong and Sohal (2002); CT employed three items, and AFFC was measured using four items, both sourced from Grégoire and Fisher (2008). Before sharing the entire survey, a preliminary test was conducted with 40 individuals. These participants were selected based on two criteria: they held bank accounts and had experienced problems while using online banking services. Thus, the objective of this pretest was to detect any possible concerns or deficiencies in the questionnaire and provide an opportunity to rectify them before implementing the comprehensive survey. After completing the validation process, the questionnaire was electronically disseminated across several means, including social media and email, using a link stored on the Google Forms platform. The data collection period extended from September to October 2023, providing considerable time to gather a comprehensive and representative sample. To alleviate potential bias, the survey was made accessible at multiple intervals throughout the day and week, meeting the diverse schedules of potential respondents. Through the rigorous screening procedure, 495 people initially participated in the survey. Following meticulous data cleaning and validation, 50 surveys were excluded from the analysis due to missing or inaccurate data. As a result, the final sample consisted of 445 fully completed questionnaires. This curation aimed to guarantee the quality and integrity of the dataset for further interpretation and analysis.

4. Data analysis and results

This study employed two software packages for data analysis: Smart PLS 3.2.9 and SPSS 28. The research methodology incorporated Partial Least Squares Structural Equation Modeling (PLS-SEM), which was conducted in two distinct phases. The measuring model was evaluated in the initial phase: constructs, internal consistency, convergent validity, and discriminant validity. The structural model underwent analysis in the second phase, and hypotheses were evaluated. PLS was selected to examine psychometric characteristics and offer evidence on the existence or lack of associations (Fornell & Larcker, 1981). After the issue of missing data was investigated, it was found that some indicators had a low rate of missing values. As a remedy, the mean imputation method in SPSS and Smart PLS was used as an solution to handle this problem (Hair et al., 2017).

4.1. Descriptive statistics

The demographic data of the study participants were analyzed descriptively, revealing their general characteristics and composition. The survey consisted of 49.2% male and 50.8% female respondents. Most participants followed the National Bank of Egypt (50.3%), whereas Alexandria Bank had a smaller representation (5.8%). A considerable number of participants, 53.9%, were aged between 21 and 30, with those 40 and above constituting a smaller percentage (9.9%). Regarding educational background, 45.8% held a bachelor's degree, while a smaller proportion possessed postgraduate degrees (26.1%). A comprehensive summary of the demographics of the respondents is shown in Table 1.

Table 1. Sample characteristics

Factors	Sample	Frequency	Percent
Gender	Male	219	49.2
	Female	226	50.8
Age	From 18 to 20	73	16.4
	From 21 to 30	240	53.9
	From 31 to 40	88	19.8
	More than 40	44	9.9
Education	High school	125	28.1
	Bachelor's degree	204	45.8
	Postgraduate degree	116	26.1
Bank affiliation	Banque Misr	120	27.0
	National Bank of Egypt	224	50.3
	Banque du Caire	26	5.8
	Alexandria bank	26	5.8
	Agricultural bank	49	11.0
	Total	445	100

Table 2 presents the study variables' correlation coefficients, means, and standard deviations. PRS, CT, AFFC, and CBI positively correlate with DJ, PJ, and IJ. Additionally, PRS has substantial positive correlations with CT, AFFC, and CBI, all at the 0.01 level. The range of

mean values (3.75 to 3.92) suggests considerable consensus among the participants. Normal distribution is shown by skewness values ranging from –2 to +2, as confirmed by the normality test outcomes in Table 2.

Table 2. Inter factor correlation matrix for latent variables

Variables	Mean	SD	Skewness	DJ	PJ	IJ	PRS	AFFC	CT	CBI
DJ	3.75	.77	–.932	1.00						
PJ	3.78	.73	–.725	**.72	1.00					
IJ	3.82	.69	–.669	**.68	**.75	1.00				
PRS	3.76	.78	–.764	**.65	**.71	**.76	1.00			
AFFC	3.89	.71	–.723	**.49	**.59	**.65	**.63	1.00		
CT	3.92	.70	–.980	**.60	**.71	**.68	**.62	**.74	1.00	
CBI	3.82	.72	–.814	**.66	**.73	**.73	**.77	**.70	**.71	1.00

Note: **Correlation is significant at 0.01.

4.2. Assessment of measurement model

Cronbach's Alpha was established to assess the validity and reliability of the reflective scales employed in the survey. The Cronbach's Alpha coefficients for all scales included in the study are acceptable (above 0.70), ranging from 0.726 to 0.872. Additionally, all standard loading coefficients fall within an acceptable range, with values exceeding 0.5 (Byrne, 2016). Moreover, composite reliability (CR) and average variance extracted (AVE) exceed the usual thresholds of 0.7 and 0.5, respectively (Hair et al., 2017). The outcomes confirm the scales' validity in measuring the study variables (see Table 3). The Heterotrait-Monotrait (HTMT) ratio correction method and the Fornell–Larcker criterion are employed to assess discriminant validity (Henseler et al., 2015). The discriminant values presented in Table 4 are still within HTMT 1's allowed range (Gaskin et al., 2018).

Table 3. Assessment of measurement model

Variables	Item code	Loading	Cronbach's α	Rho_A	CR	AVE
	Cut-off values	> 0.5		> 0.7		> 0.5
DJ	DJ1 DJ2 DJ3 DJ4	0.78 0.65 0.86 0.84	0.794	0.814	0.867	0.621
PJ	PJ1 PJ2 PJ3 PJ4	0.78 0.81 0.82 0.78	0.817	0.821	0.879	0.645
IJ	IJ1 IJ2 IJ3 IJ4	0.79 0.80 0.73 0.76	0.779	0.782	0.858	0.602

End of Table 3

Variables	Item code	Loading	Cronbach's α	Rho_A	CR	AVE
PRS	PRS1 PRS2 PRS3 PRS4	0.84 0.83 0.87 0.84	0.872	0.874	0.913	0.723
CT	CT1	0.79	0.835	0.835	0.890	0.669
	CT2	0.82				
	CT3	0.84				
	CT4	0.80				
AFFC	AFFC1	0.69	0.726	0.756	0.845	0.647
	AFFC2	0.87				
	AFFC3	0.84				
CBI	CBI1 CBI2 CBI3 CBI4	0.81 0.78 0.80 0.76	0.796	0.797	0.867	0.621

Note: Cut-off values reference: Hair et al. (2017).

Table 4. Discriminant validity using HTMT

	DJ	PJ	IJ	PRS	CT	AFFC	CBI	Gender	Gender x IJ	Gender x PJ	Gender x DJ
DJ											
PJ	0.897										
IJ	0.865	0.916									
PRS	0.778	0.842	0.900								
CT	0.746	0.864	0.850	0.732							
AFFC	0.652	0.764	0.860	0.791	0.877						
CBI	0.836	0.898	0.889	0.827	0.869	0.810					
Gender	0.101	0.106	0.117	0.095	0.058	0.144	0.148				
Gender x IJ	0.611	0.632	0.887	0.636	0.598	0.597	0.624	0.067			
Gender x PJ	0.644	0.839	0.671	0.552	0.614	0.545	0.632	0.064	0.756		
Gender x DJ	0.862	0.624	0.632	0.531	0.541	0.485	0.602	0.057	0.713	0.747	

4.3. Structural model assessment and hypotheses testing

Prior to assessing the structural models, it is essential to confirm the absence of full collinearity issues among the constructs. Moreover, all VIF values were below 3.3, indicating the absence of collinearity issues. The structural model analysis contains the evaluation of path coefficients (R^2) and effect size (F^2). The bootstrapping method is employed to ascertain the significance of the route coefficient through 5000 resamples (Hair et al., 2017). The structural model analysis has shown that IJ, PJ, and DJ explain 64.2% of the variance in PRS, while 70.1% of the variation in CBI is defined by the variation in PRS, CT and AFFC with Cohen's effect size

for PRS (f^2= 0.424), for CT (f^2 = 0.088), and for AFFC (f^2 = 0.061). The results also highlighted that 39.3% of the variation in CT is explained by the variation in PRS with Cohen's effect size (f^2 = 0.647), and 40.2% of the variation in AFFC is defined by the variation PRS with Cohen's effect size (f^2 = 0.673). The Standardized Root Mean Square Residual (SRMR) yielded a value of 0.074, and the Normal Fit Index (NFI) was 0.922, indicating that the model satisfies the requisite criteria for goodness-of-fit in PLS-SEM. For d_ULS, the estimated value (3.811) falls within the confidence interval, which includes zero. Hence, this suggests that the model fits according to this criterion. For d_G: The estimated value (1.228) also falls within the confidence interval, and the interval includes zero. Hence, this would also suggest a good fit. The saturated and estimated model Chi² values differ relatively small (1850.199 – 1717.383). Thus, this slight difference indicates that the estimated model isn't far from the saturated model in terms of fit, which is a positive indication.
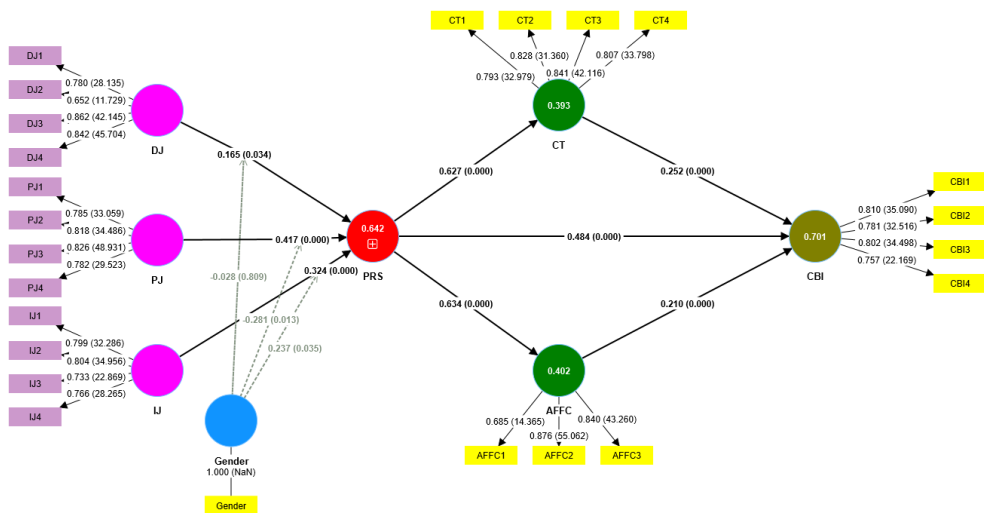

Figure 2. Structural model assessment

The outcomes of testing hypotheses in Table 5 and Figure 2 show that hypotheses H1a, H1b, and H1c have been supported, where DJ positively influences PRS (β = 0.165, T= 2.120, and P = 0.034), PJ positively influences PRS (β = 0.417, T= 4.980, and P = 0.000) and IJ positively influences PRS (β = 0.324, T= 3.626, and P = 0.000). Moreover, the results showed that PRS positively influenced CBI (β = 0.484, T= 10.291, and P = 0.000). Thus, H2 is supported. Furthermore, the results showed that PRS positively influenced CT (β = 0.627, T= 15.549, and P = 0.000). Additionally, PRS positively influenced AFFC (β = 0.634, T= 16.593, and P = 0.000). Thus, H3 and H4 are supported. Besides, CT positively influenced CBI (β = 0.252, T= 4.533, and P = 0.000), and AFFC positively influenced CBI (β = 0.210, T= 3.907, and P = 0.000), so the result supports H5 and H6. Moreover, PRS mediates the positive indirect effects of DJ, PJ and IJ on CBI since DJ indirectly influenced CBI through PRS (β = 0.080, T= 2.072, and P = 0.038), PJ indirectly influenced CBI through PRS (β = 0.202, T= 4.276, and P = 0.000), and IJ indirectly influenced CBI through PRS (β = 0.157, T= 3.412, and P = 0.001). Hence, H7a, H7b and H7c are supported. Besides, PRS indirectly influenced CBI through CT (β = 0.158, T= 4.237, and P = 0.000) and AFFC (β = 0.133, T= 3.723, and P = 0.000). Therefore, H8 and H9 are supported.

Moreover, gender differences were found in the impact of PJ on PRS (β = −0.136, T= 2.256, and P = 0.024), which means the differences were for females. Thus, H10b is supported. Similarly, gender differences were found in the impact IJ on PRS (β = 0.115, T= 2.077, and P = 0.038), which means the differences were for males. Thus, H10c is partially supported because moderation was found, but with better results for males (not for females as H10c assumed) – see Figures 3 and 4. Finally, the results show no moderation effect of gender on the relationship between DJ and PRS (β = −0.013, T= 0.243, and P = 0.808) below statistical significance. Thus, H10a is rejected.

Table 5. Results of hypothesis testing

Hypotheses	Paths	B	t-value	p-value	Remark
			DIRECT EFFECTS		
H1a	DJ → PRS	0.165	2.120	0.034	
H1b	PJ → PRS	0.417	4.980	0.000	Supported
H1c	IJ → PRS	0.324	3.626	0.000	
H2	PRS → CBI	0.484	10.291	0.000	Supported
H3	PRS → CT	0.627	15.549	0.000	Supported
H4	PRS → AFFC	0.634	16.593	0.000	Supported
H5	CT → CBI	0.252	4.533	0.000	Supported
H6	AFFC → CBI	0.210	3.907	0.000	Supported
			INDIRECT EFFECTS		
H7a	DJ → PRS → CBI	0.080	2.072	0.038	
H7b	PJ → PRS → CBI	0.202	4.276	0.000	Supported
H7c	IJ → PRS → CBI	0.157	3.412	0.001	
H8	PRS → CT→ CBI	0.158	4.237	0.000	Supported
H9	PRS → AFFC→ CBI	0.133	3.723	0.000	Supported
H10a	Gender × DJ → PRS	−0.013	0.243	0.808	Not Supported
H10b	Gender × PJ → PRS	−0.136	2.256	0.024	Supported
H10c	Gender × IJ → PRS	0.115	2.077	0.038	Partially Supported

Note: Relationships are significant at P < 0.05.

Figures 3 and 4 show how gender differences affect customers' perception of justice in the cases of e-service recovery from service failures. When consumers' perception of justice increases from a lower to a higher level, the effect on their satisfaction with their recovery experiences becomes more significant. Specifically, the impact of PRJ is more significant for females than men in procedural justice (PJ). On the contrary, concerning interactional justice (IJ), men are more impacted than females. Then, the impact of various degrees of PRJ and PRS differs according to the gender-specific characteristics of IJ and PJ.

5. Discussion

The results of this study demonstrate that each of the three aspects of PRJ (DJ, PJ, IJ) exerts a positive influence on PRS. Also, the findings show that gender moderates the impact of PJ on PRS and the impact of IJ on PRS as follows: PJ makes women exhibit higher levels of
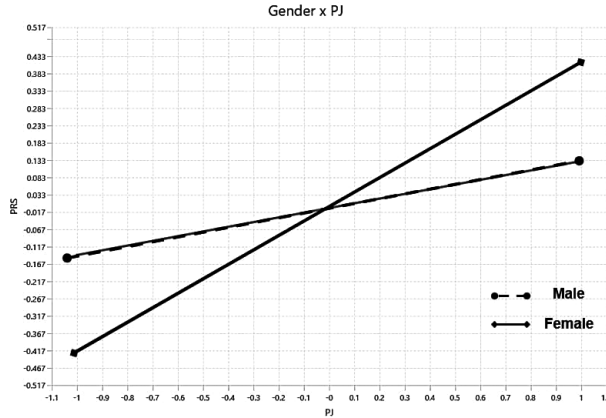
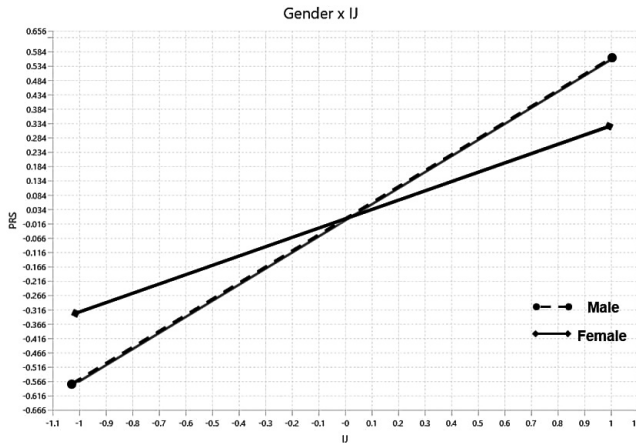**Figure 3.** Moderation graph H10b

Figure 4. Moderation graph H10c

PRS. In contrast, IJ makes men encounter more elevated levels of PRS. The results also show that PRS positively influences CBI, CT, and AFFC. CT and AFFC also have positive effects on CBI. So, PRS positively impacts CBI through its direct and indirect effects (via CT and AFFC). Thus, CT and AFFC mediate the relationship between PRS and CBI. Likewise, PRS mediates the positive effects of DJ, PJ, and IJ on CBI. The results of this investigation support the notion that PRS may be enhanced by using perceived fairness to resolve customer complaints over banking service failures. As a result, this stresses the need to ensure fair treatment of consumer concerns and complaints.

Our findings provide evidence that using the concept of perceived justice can improve the effectiveness of PRS in addressing customer complaints related to online problems in banking services. Consequently, this emphasizes the importance of guaranteeing fair treatment of consumer concerns and complaints. Therefore, to address any issues that may have occurred, banks should contemplate providing compensation to customers through means such as flexible service hours, incentive schemes, efficient communication, or other approaches like

FAQs, e-support pages, discussion boards, online data, and technology-mediated interactions that improve the overall customer experience. Therefore, participating in such events has the potential to lead to PRS, WOM, and consumer loyalty (Villi & Koc, 2018; Chang & Hung, 2018; Ali, 2023). These findings are consistent with the findings of Chao and Cheng (2019). In the context of e-service failures, technology-mediated encounters that exhibit respect, understanding, fair compensation, and sincere care significantly impact consumers' conceptions of justice.

This study builds on previous research by illustrating that effective service recovery can be achieved through strategically utilizing online resources, including data-driven approaches and technology-mediated interactions (Agnihotri & Bhattacharya, 2024). When carefully planned and executed, consumers view these digital solutions as fair, improving the whole recovery process. The results emphasize that customers' satisfaction with e-failure recovery contacts is closely connected to their perception of the justice of the online service recovery process. Hence, this link emphasizes the crucial significance of fairness theory in comprehending and foretelling customer reactions to e-service failures and subsequent e-recovery endeavors. Likewise, the study illustrates that the several aspects of justice – distributive, procedural, and interactional – have separated but intertwined influences on consumer perceptions and satisfaction results. Curiously, our findings deviate from the conclusions of earlier investigations (Nikbin et al., 2012), which presented varying results concerning the correlation between perceived justice and consumer satisfaction in situations involving service recovery. The findings have also shown a statistically significant association between PRS and CBI. The results demonstrate that incorporating PRJ and PRS components into electronic recovery management systems can positively impact the bank's CBI through direct and indirect means. Therefore, achieving this favorable result depends on customers perceiving the response to their complaints as fair, prompt, and fulfilling. The study highlights the significance of implementing customer-centric strategies to improve PRS and promote customer behavioral intentions and loyalty in the banking industry. This strategy is crucial at a time when digital banking and fast communication have increased customer expectations for quick, equitable, and clear complaint resolution.

Likewise, research suggests that the components of AFFC and CT, which establish the relational connection, are essential in fostering a durable relationship between banks and their customers. This lasting relationship leads to favorable CBI, as emotional attachments cause consumers to disregard slight issues in the bank's service provision. As a result, establishing emotional connection and trust, achieved via efficient complaint handling and regular pleasant encounters, can act as a protective barrier against occasional lapses in service quality. Thus, by implementing these strategies, banks may address complaints and convert these interactions into chances to improve customer relationships and boost brand loyalty. Therefore, this comprehensive approach aligns with the changing demands of contemporary customers and positions banks to succeed in a highly competitive and digitalized financial environment (Moraru et al., 2022; Rambocas et al., 2018).

As a result, this engenders positive cognitive evaluation (recovery satisfaction) and signifies the perception of equitable treatment in the form of PRJ, which subsequently reinforces or fortifies AFFC and CT (warm sentiments, fondness, and trust) towards the bank, and inspires positive behavioral intentions of customers (CBI) these findings are consistent with Yim et al. (2008). Such critical findings are crucial to developing theory and subsequent researchers' efforts to investigate these issues. The outcomes on the moderating influence of

gender provide intriguing perspectives due to variations in the cognitive processes shown by male and female customers. Gender enhances the impact of PRJ on PRS. Specifically, females exhibit higher satisfaction levels with the equitable treatment of PJ provided through service recovery. In contrast, males demonstrate greater satisfaction with the fair treatment of IJ. On the other hand, the relationship between consumers' views of DJ and PRS does not exhibit gender-based distinctions. Therefore, the findings regarding the moderating influence of gender offer intriguing perspectives due to disparities in the cognitive processing of male and female consumers. Thus, the gender factor enhances the impact of PRJ (DJ, PJ, and IJ) on satisfaction with recovering from a service failure. Specifically, females generally report greater satisfaction than males regarding fair treatment during service recovery. Likewise, highly satisfied females are more likely than males to repurchase from the service organization. The findings are statistically significant. These results are consistent with Galbreath et al. (2020), Akinci and Aksoy (2019) or Daskin and Kasim (2016), which stated that males and females had differing viewpoints concerning service recovery management. Therefore, females tend to perceive service failures more gravely than their male counterparts. Female customers typically demonstrate heightened appreciation and satisfaction with the remedial measures taken by bank workers in response to their grievances. In contrast, males generally expect to be acknowledged, want comprehensive explanations from organizational staff concerning their grievances, and anticipate appropriate restitution, frequently exhibiting diminished appreciation for remedial actions.

6. Theoretical and practical implications

This research demonstrates significant theoretical contributions within the framework of the online banking industry. Consequently, the current study sought to investigate the effects of the three dimensions of PRJ, namely DJ, PJ, and IJ, according to the theory of justice (Adams, 1965; Blau, 1964). Thus, justice theory is depicts how consumers respond to various contentious situations (Lind & Tyler, 1988). Consequently, this research demonstrates that consumers in the online banking setting evaluate the fair treatment equity ratio with other consumers and that positive confirmation of PRJ dimensions ultimately affects PRS. Furthermore, the finding of the indirect influences of DJ, PJ, and IJ (the three dimensions of PRJ) on CBI via PRS constitutes a noteworthy contribution to the corpus of existing knowledge. Furthermore, it determines the impact of PRS on CT and AFFC. Thirdly, CT and AFFC have never been used as mediators to examine this link between PRS and CBI in online banking.

Consequently, using the cognitive appraisal theory (Smith & Kirby, 2001), this research illustrates how strengthening the AFFC and CT connection with the firm may enhance the effectiveness of PRS, which eventually influences consumer behavioral intentions. In conclusion, a substantial addition to the corpus of knowledge is examining how gender moderates the connection between PRJ and PRS. In service recovery contexts, gender has received limited attention. According to gender schema theory and social role theory, males and females perceive recovery strategies differently due to differences in cognitive abilities and characteristics (Eagly, 1997; Powell, 1999). Consequently, the findings of this study indicate that the perception of procedural justice leads females to demonstrate more satisfaction with service recovery and exhibit a higher level of behavioral intentions compared to males. On the other hand, this research has shown that men have greater satisfaction with service recovery and stronger intents to engage in positive behaviors when IJ is perceived. Consequently, the study contributes to the literature by elucidating the gender-specific variations and the moderating

effect of gender in the relationships between PRJ and PRS (PJ-PRS relationship and IJ-PRS relationship).

This research significantly contributes to key banking areas and offers a comprehensive approach to improving customer satisfaction and subsequent actions, particularly for users with negative experiences with online banking services. Therefore, it follows that it aids managers in comprehending and identifying current deficiencies in the connection between the bank and its customers and devising strategies to foster a lasting partnership, enhance the quality of relationships, and improve customers' behavioral intentions. Further, the research elucidates the fundamental causes and aims that propel consumer complaints regarding service disruptions and failures. Consequently, it delineates three essential principles pertinent to the banking business (gender, AFFC, and CT), which substantially aid in formulating effective customer retention strategies.

While service failures due to human and technical errors are inevitable, the complaint processing department can alleviate their impact by employing suitable strategies (Arsenovic et al., 2023). Bankers must build a customer relationship management system to address consumer complaints and recuperate from service interruptions. This involves the creation of a digital department for complaint management, tasked with handling complaints, enhancing the performance of service personnel, and increasing consumer trust. Gender differences should also be considered, given that the failure handling preferences of males and females vary, potentially impacting their views of equitable treatment. It is vital to pay attention to the viewpoints of female customers and provide a high degree of satisfaction with procedures and service recovery techniques. Women should get enough information about the procedures and available methods choices since they are thorough information processors. On the contrary, male customers exhibit selective information processing tendencies; they prioritize results and interactions, possess a more assertive disposition, are open to undertaking risks, and want prompt resolutions to their concerns. Complaints management needs to use proactive recovery tactics to foster loyalty and happiness among the male clientele of the service business. For instance, it is critical to plan for timely recovery while ensuring effective communication and engagement with frontline personnel.

7. Conclusions, limitations and future studies

This study underscores the significance of perceived justice in service recovery for improving customer satisfaction, relationship quality, and behavioral intentions. The results indicate gender disparities in satisfaction, with females prioritizing procedural justice and males favoring interactional justice. Additionally, affective commitment and trust act as mediators, highlighting banks' need to adopt customer-centric methods to guarantee equitable, timely, and efficient complaint handling. These strategies can cultivate robust client relationships and brand allegiance within the online banking sector. It is essential to recognize several intrinsic limitations present in this research. The research is constrained in scope since it only examines the e-service recovery system of the banking industry in Egypt. Therefore, the research findings are specific to this industry. Future research might expand the scope of the investigation to embrace a wide array of service sectors, such as hospitality, travel, mobile services, and insurance, to augment the model's practicality. These industries have unique characteristics and are prone to experiencing significant e-service failures. Furthermore, this involved quantitative study, and the analytical outcomes of the questionnaire limited the findings, so qual-

itative approaches, such as interviews, might disclose factors that the current study did not identify. Furthermore, the research did not examine customers with recurring and numerous service failures from the same financial institution. This aspect may have yielded significant knowledge of customers' perspectives on service recovery in such scenarios. Also, the study should have accounted for other variables, such as the severity of service failure. As a result, further investigations may assess the model's efficacy by integrating these variables. In conclusion, the research collected data on every occurrence of e-service failures. Nevertheless, forthcoming studies initiatives possess the capacity to analyze and examine diverse classifications of e-service failures that originate from unique channels, including mobile banking, online banking, and ATMs, and scrutinize them individually.

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