

“Emotions and customer experience in US retail banking: a PANAS-based structural equation model”

AUTHORS	Carlos Alberto Espinosa Fernández  Ainhoa Rodríguez Oromendía  Iñigo Tejera Martín 
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Ainhoa Rodríguez Oromendía, Iñigo
Tejera Martín, 2026

Carlos Alberto Espinosa Fernández,
Ph.D., Doctoral Program, Faculty of
Economy, Department of Business
Economics and Accounting, National
University of Distance Education
(UNED), Spain. (Corresponding
author)

Ainhoa Rodríguez Oromendía, Ph.D.,
Professor of Marketing, Faculty of
Economy, Department of Business
Economics and Accounting, National
University of Distance Education
(UNED), Spain.

Iñigo Tejera Martín, Ph.D., Professor
of Applied Economics and Statistics,
Faculty of Economy, Department of
Applied Economics and Statistics,
National University of Distance
Education (UNED), Spain.



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Carlos Alberto Espinosa Fernández (Spain), Ainhoa Rodríguez Oromendía (Spain),
Iñigo Tejera Martín (Spain)

EMOTIONS AND CUSTOMER EXPERIENCE IN US RETAIL BANKING: A PANAS-BASED STRUCTURAL EQUATION MODEL

Abstract

Affective responses are an important component of customer experience, but evidence on how positive and negative affect relate to downstream outcomes in US retail branch banking remains limited. This study examines generalized affect associated with branch interactions, measured with the Positive and Negative Affect Schedule (PANAS), and its associations with satisfaction, loyalty, and willingness to recommend. Cross-sectional survey data were collected in April 2024 from 400 US retail banking customers through the Pollfish online panel and analyzed using confirmatory factor analysis and covariance-based structural equation modeling. Standardized structural estimates show that Positive Affect is positively associated with Satisfaction ($\beta = 0.441$, $p < 0.001$), whereas Negative Affect is negatively associated with Satisfaction ($\beta = -0.292$, $p < 0.001$). Satisfaction is associated with Loyalty ($\beta = 0.504$, $p < 0.001$) and Recommendation ($\beta = 0.248$, $p < 0.001$), while Loyalty is also associated with Recommendation ($\beta = 0.572$, $p < 0.001$). The model explains 28.0% of the variance in Satisfaction, 25.4% in Loyalty, and 53.2% in Recommendation. Overall fit is satisfactory ($\chi^2(400) = 545.123$, CFI = 0.991, TLI = 0.990, RMSEA = 0.030, 90% CI [0.023, 0.036]). PANAS is applied as an established affect measure rather than newly validated. Because no specific recent branch encounter or recall period was defined, affect scores are interpreted as generalized recalled affect, and the cross-sectional design precludes causal inference.

Keywords

affect, satisfaction, loyalty, recommendation, branch banking, structural equation modeling

JEL Classification

G21, M31, C83

INTRODUCTION

Customer experience (CX) is a central concern in services research because customers evaluate not only what an organization delivers but also how interactions make them feel (Verhoef et al., 2009; Klaus & Maklan, 2013; Lemon & Verhoef, 2016). In retail banking, where many core products are readily substitutable, affective responses may help explain differences in satisfaction, loyalty, and advocacy across otherwise similar service relationships (Bagozzi et al., 1999; Laros & Steenkamp, 2005; Ladhari et al., 2011). Evidence quantifying positive and negative affect within a structural model of US branch-banking experience nevertheless remains limited.

The empirical setting is US retail customers' face-to-face branch interactions. The study uses the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988) as an established affect measure and covariance-based structural equation modelling (SEM) to examine the relationships among affect, satisfaction, loyalty, and recommendation.

The contribution is empirical rather than psychometric: PANAS is applied inside a customer-experience model, and the study does not claim a new or complete validation of the instrument. The cross-sectional design also requires a non-causal interpretation of the estimated relationships.

1. LITERATURE REVIEW AND HYPOTHESES

This section reviews the literature that underpins the five-construct model. It first considers customer experience and affect in banking, then the satisfaction-loyalty relationship, and finally recommendation. The review is kept focused on the theoretical reasoning required to derive the hypotheses tested in this study.

1.1. Customer experience and affect in banking

Customer experience has evolved from early experiential-marketing perspectives toward a broader view that integrates customers' cognitive and affective responses across interactions with a firm (Pine & Gilmore, 1998; Schmitt, 1999; Verhoef et al., 2009; De Keyser et al., 2015; Lemon & Verhoef, 2016). In banking, this perspective is particularly relevant because customers frequently perceive core services as weakly differentiated, making the quality of the interaction itself an important source of value (Howcroft et al., 2007; Klaus, 2014).

For the present study, the relevant CX component is affect associated with service interactions. Emotional responses complement cognitive evaluations of service quality and value and can be associated with subsequent satisfaction, loyalty, and recommendation (Bagozzi et al., 1999; Berry et al., 2002; Mattila & Enz, 2002; Ladhari et al., 2011). The analysis therefore narrows the broader CX literature to the affective mechanism represented in the proposed model.

The affective component of customer experience has been measured through several frameworks, including the Pleasure-Arousal-Dominance model (Mehrabian & Russell, 1974), consumption-emotion measures (Richins, 1997), and PANAS (Watson et al., 1988). PANAS distinguishes ten positive-affect and ten negative-affect terms and is useful when the analytical aim is to represent positive and negative emotional states as related but distinct dimensions.

PANAS was selected because it offers a parsimonious, established two-dimensional affect structure (Watson et al., 1988). Service research has operationalized emotion in different ways, including pleasure/arousal and emotional satisfaction (Bigné et al., 2005; Ladhari et al., 2011); PANAS is used here specifically because it represents positive and negative affect as distinct dimensions. In this study, the scale is not revalidated as a new instrument; instead, its measurement properties are assessed within the present US branch-banking sample before the structural relationships are interpreted.

In service encounters, positive affect can accompany perceptions of trust, attention, and successful interaction, whereas negative affect can reflect anxiety, irritation, or discomfort. Such emotional responses are theoretically relevant because satisfaction incorporates not only cognitive evaluations but also affective reactions to the service experience (Liljander & Strandvik, 1997; Bagozzi et al., 1999).

1.2. Satisfaction and loyalty in banking

Customer satisfaction represents an overall post-experience evaluation formed by comparing perceived performance with expectations and by integrating cognitive and affective responses to the service encounter (Churchill & Surprenant, 1982; Anderson & Sullivan, 1993). In banking, satisfaction has repeatedly been linked to service quality, perceived value, and the customer's accumulated interaction history (Levesque & McDougall, 1996; Keisidou et al., 2013).

Because affective reactions form part of this evaluation, positive and negative emotions should be associated with satisfaction in opposite directions. Prior service research supports the relevance of emotional responses to satisfaction and subsequent behavioural intentions (Mattila & Enz, 2002; Ladhari et al., 2011). Accordingly, the first hypothesis is specified directionally for the two affect dimensions.

Customer loyalty refers to a sustained preference or intention to continue a relationship with a provider despite available alternatives (Oliver, 1999). In retail banking, satisfaction is one of its most consistently documented antecedents (Bei & Chiao, 2001; Beerli et al., 2004; Yang & Peterson, 2004), although the strength of the relationship can vary across customer and market conditions.

A satisfactory banking experience can reinforce both attitudinal preference and intentions to remain with the bank. Emotional engagement may contribute to this process, but the structural model tested here links affect to loyalty through the observed sequence affect-satisfaction-loyalty rather than claiming a formally tested causal mediation mechanism.

1.3. Recommendation in banking

Recommendation, or positive word of mouth (WoM), refers to informal communication in which customers share evaluations of a provider with others (Arndt, 1967; Westbrook, 1987). In services, recommendation is especially consequential because prospective customers often rely on the experiences of existing users when evaluating intangible offerings (Brown et al., 2005; Sweeney et al., 2020).

Satisfaction has been repeatedly associated with positive recommendation intentions (Athanassopoulos et al., 2001; Ranaweera & Prabhu, 2003; Wirtz & Chew, 2002), while loyalty can strengthen advocacy by increasing customers' willingness to speak positively about the provider (Kandampully et al., 2015; Ladhari et al., 2011). These relationships are particularly relevant in banking, where trust and continuity may shape whether customers recommend an institution.

Taken together, the literature indicates that affective responses are a distinct component of banking customer experience and are systematically related to evaluative and behavioral outcomes. Positive and negative affect are expected to be associated with satisfaction in opposite directions, while satisfaction and loyalty provide the downstream links to recommendation. The unresolved issue addressed here is the magni-

tude of these relationships when PANAS is applied in a US retail branch-banking context.

The purpose of this study is to estimate the associations among positive affect, negative affect, satisfaction, loyalty, and recommendation in US retail branch banking using a covariance-based structural equation model.

Study hypotheses are as follows:

H1a: Positive affect is positively associated with customer satisfaction.

H1b: Negative affect is negatively associated with customer satisfaction.

H2: Customer satisfaction is positively associated with customer loyalty.

H3: Customer satisfaction is positively associated with customer recommendation.

H4: Customer loyalty is positively associated with customer recommendation.

These five paths define the conceptual model shown in Figure 1. The model is intentionally parsimonious and is evaluated as a cross-sectional structural model rather than as evidence of temporal causality or formal mediation.

2. METHOD

The study uses a quantitative, cross-sectional design. This section describes the measures, the online-panel fieldwork and sample, and the statistical procedures used to evaluate the measurement and structural models. The empirical analysis is limited to the branch PANAS block of the administered questionnaire.

2.1. Measures

The questionnaire combined the 20 PANAS affect terms with multi-item measures of satisfaction, loyalty, and recommendation. PANAS items used five-point intensity anchors from 1 (very slightly or not at all) to 5 (extremely). Satisfaction, loyalty, and recommendation items used five-point agreement scales from 1 (strongly disagree) to 5 (strongly agree).

The administered questionnaire contained two PANAS emotion blocks. Item 8 asked respondents to rate how they experience the twenty PANAS emotions when visiting a bank branch and speaking with a bank employee; Item 9 asked the same terms for telephone contact. The present study is explicitly limited to the branch context, so only Item 8 was included in the analytic dataset and SEM. Importantly, Item 8 did not anchor responses to a specific recent encounter or define a recall period, and eligibility did not require a branch visit within a specified recent period. The affect scores should therefore be interpreted as generalized recalled affect associated with branch interactions rather than as event-contingent emotional states. No averaging or aggregation across branch and telephone channels was performed. The SEM contains 30 substantive observed indicators: 10 positive-affect items, 10 negative-affect items, 3 satisfaction items, 4 loyalty items, and 3 recommendation items.

The loyalty construct included four indicators. One item was negatively worded in the administered questionnaire (“I will switch to a competitor if I experience a problem with my bank”) and was reverse-coded before analysis so that all four analytic indicators were oriented in the same direction. Recommendation was measured with three indicators covering positive word of mouth, sharing experiences, and explicit recommendation.

2.2. Data collection and sample

Fieldwork was conducted in April 2024 through the Pollfish online panel. Eligibility required residence in the United States, age 18 years or older, and use of retail banking services. The final analytic sample contained 400 respondents. Recruitment used an online-panel quota-balancing setup rather than probability-based stratified random sampling. The balancing variables were gender, age (five categories), education (five categories), annual household income (eight categories including ‘prefer not to say’), and municipality size (five categories). The available study records do not contain a separate vector of fixed externally calibrated target percentages beyond this demographic balancing configuration; accordingly, the manuscript does not claim census-

representative stratification. No post-stratification weighting was applied, and all SEM analyses use the 400 completed cases unweighted. Table 1 reports the realised distributions.

The questionnaire asked respondents about their main bank and branch-related experience. It also contained the ancillary telephone PANAS block described above; that block is reproduced in the Appendix for transparency but was excluded from the present SEM. The final analytic file therefore contains one observation for each of the 20 branch PANAS terms, with no branch-phone averaging or aggregation.

Table 1 summarizes the realized sample distribution across the five demographic balancing variables. These demographics were used to describe the sample and were not included as predictors in the structural model.

2.3. Statistical analysis

The measurement and structural models were estimated by maximum likelihood within a covariance-based SEM framework. The original model was analyzed in AMOS 29, with SPSS 29 used for data preparation and complementary diagnostics (Byrne, 2010; Hair et al., 2014; Kline, 2015). Measurement quality was assessed through standardized loadings, Cronbach’s alpha, composite reliability (CR), Average Variance Extracted (AVE), and heterotrait-monotrait (HTMT) ratios. Common-method variance was assessed through procedural safeguards (Podsakoff et al., 2003), an unrotated principal-components Harman diagnostic, and an additional maximum-likelihood CFA robustness comparison between the hypothesized five-factor measurement model and a single-factor model in which all 30 substantive indicators loaded on one factor. Because no marker variable was included in the original survey, residual common-method variance is retained as a limitation.

3. RESULTS

Results are reported in two stages. The model specification, measurement quality, discriminant validity, common-method robustness checks, and

Table 1. Realized sociodemographic distribution of the sample

Characteristic	Description	Realized sample (%)
Gender	Male	44.8%
	Female	55.3%
Age	18-24 years	12.5%
	25-34 years	22.3%
	35-44 years	27.3%
	45-54 years	16.3%
	Over 54 years	21.8%
Municipality Size	Fewer than 5,000 inhabitants	12.8%
	Between 5,000 and 20,000	23.3%
	Between 20,001 and 100,000	28.5%
	Between 100,001 and 1,000,000	23.0%
	Over 1,000,000	12.5%
Education Level	Middle school	0.8%
	High school	35.5%
	Vocational/technical college	10.5%
	University	37.3%
	Postgraduate	16.0%
Annual Income (USD)	Under \$25,000	24.0%
	\$25,000-\$49,999	24.0%
	\$50,000-\$74,999	18.0%
	\$75,000-\$99,999	8.8%
	\$100,000-\$124,999	8.5%
	\$125,000-\$149,999	4.3%
	\$150,000 or more	8.3%
	Prefer not to say	4.3%

Note: Percentages may not sum to exactly 100% due to rounding.

overall fit are considered first; the structural coefficients, explained variance, and hypothesis tests are then interpreted. Standardized coefficients are used when comparing the magnitude of structural relationships.

3.1. Model specification

The covariance-based SEM contains five latent constructs measured by 30 observed indicators: Positive Affect (10), Negative Affect (10), Satisfaction (3), Loyalty (4), and Recommendation (3). Table 2 summarizes the measurement specification, and Figure 1 shows the hypothesized structural model.

3.2. Measurement and structural results

Table 3 reports the rechecked AMOS regression weights. Fixed marker loadings are explicitly identified and are not assigned standard errors, critical ratios, or p-values. To remove remaining rounding ambiguity, the freely estimated loading for Leal.3 is reported to four decimal places ($B = 0.9998$), distinguishing it from the fixed Leal.1 marker. The final column reports standardized estimates: standardized path coefficients for the five structural relationships and standardized factor loadings for the measurement indicators.

Table 2. Latent variables considered in the model

Variable	Number of Items
Positive emotions	10 items (Attentive, Proud, Strong, Active, Alert, Inspired, Excited, Determined, Interested, Enthusiastic)
Negative emotions	10 items (Hostile, Irritable, Guilty, Ashamed, Nervous, Jittery, Distressed, Upset, Afraid, Scared)
Satisfaction	3 items (Sat.1, Sat.2, Sat.3)
Loyalty	4 items (Leal.1, Leal.2, Leal.3, Leal.4)
Recommendation	3 items (Rec.1, Rec.2, Rec.3)

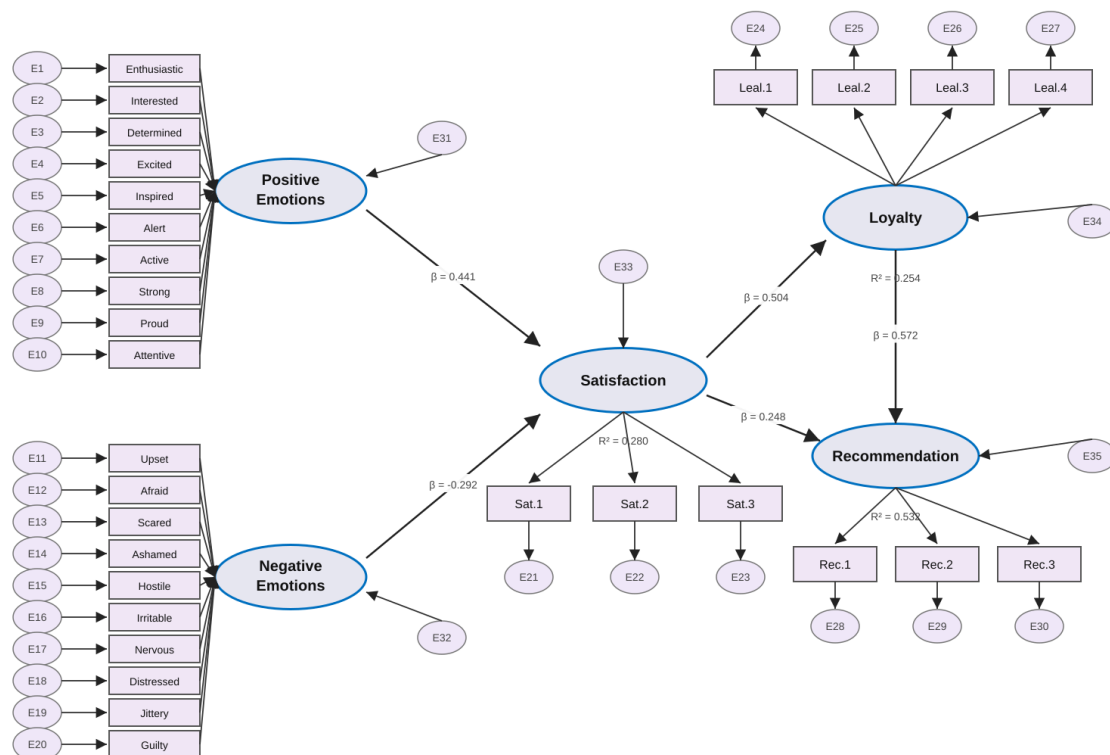


Figure 1. Proposed structural equation model

All five structural paths were statistically significant at $p < 0.001$. Positive Affect was positively associated with Satisfaction (standardized $\beta = 0.441$), whereas Negative Affect was negatively associated with Satisfaction ($\beta = -0.292$). Satisfaction was associated with Loyalty ($\beta = 0.504$) and Recommendation ($\beta = 0.248$), and Loyalty was associated with Recommendation ($\beta = 0.572$).

The endogenous R^2 values were 0.280 for Satisfaction, 0.254 for Loyalty, and 0.532 for Recommendation. These coefficients represent cross-sectional associations; no causal interpretation is assigned to them.

Measurement reliability and convergent validity were then evaluated from the standardized solution. Across the 30 indicators, standardized loadings ranged from 0.889 to 0.941. Cronbach's alpha, composite reliability, and AVE all exceeded conventional thresholds.

Cronbach's alpha values were 0.979 for Positive Affect, 0.980 for Negative Affect, 0.928 for Satisfaction, 0.961 for Loyalty, and 0.933 for Recommendation. Composite reliability values were 0.979, 0.981, 0.924, 0.961, and 0.932, respectively.

AVE values were 0.824 for Positive Affect, 0.835 for Negative Affect, 0.802 for Satisfaction, 0.861 for Loyalty, and 0.821 for Recommendation, all above the 0.50 benchmark (Fornell & Larcker, 1981). Table 4 summarizes construct-level reliability and convergent validity.

Discriminant validity was evaluated using the heterotrait-monotrait ratio (HTMT), calculated from the item-level correlations among the 30 indicators (Voorhees et al., 2016). HTMT values ranged from 0.223 to 0.703; the maximum was 0.703 for Loyalty-Recommendation, and all ratios were below the conservative 0.85 threshold.

The HTMT results, together with the reliability and AVE estimates, support the distinctiveness of the five measured constructs.

Common-method diagnostics provided an additional robustness check. Harman's unrotated principal-components analysis showed that the first component accounted for 44.6% of total variance. More importantly, a single-factor CFA fit the data very poorly ($\chi^2(405) = 9,387.653$, CFI = 0.421, TLI = 0.378, RMSEA = 0.236, SRMR = 0.278) compared with the hypothesized five-factor measurement

Table 3. Rechecked AMOS regression weights and standardized estimates

Path	B	S.E.	C.R.	p	Standardized
Satisfaction ← Negative Affect	−0.205	0.032	−6.330	< 0.001	−0.292
Satisfaction ← Positive Affect	0.372	0.040	9.274	< 0.001	0.441
Loyalty ← Satisfaction	0.677	0.065	10.347	< 0.001	0.504
Recommendation ← Satisfaction	0.303	0.057	5.333	< 0.001	0.248
Recommendation ← Loyalty	0.521	0.043	12.053	< 0.001	0.572
Attentive ← Positive Affect	1.000 (fixed)	—	—	—	0.903
Proud ← Positive Affect	1.133	0.039	29.058	< 0.001	0.900
Strong ← Positive Affect	1.004	0.033	30.524	< 0.001	0.916
Active ← Positive Affect	1.028	0.033	31.049	< 0.001	0.922
Alert ← Positive Affect	0.960	0.033	29.033	< 0.001	0.900
Inspired ← Positive Affect	0.996	0.033	30.490	< 0.001	0.916
Excited ← Positive Affect	0.996	0.035	28.347	< 0.001	0.892
Determined ← Positive Affect	1.036	0.035	29.550	< 0.001	0.906
Interested ← Positive Affect	1.026	0.035	29.192	< 0.001	0.902
Enthusiastic ← Positive Affect	1.077	0.035	31.151	< 0.001	0.923
Hostile ← Negative Affect	1.000 (fixed)	—	—	—	0.919
Irritable ← Negative Affect	0.934	0.030	31.089	< 0.001	0.905
Guilty ← Negative Affect	0.886	0.028	31.379	< 0.001	0.908
Ashamed ← Negative Affect	0.992	0.031	31.937	< 0.001	0.913
Nervous ← Negative Affect	0.931	0.028	33.174	< 0.001	0.924
Jittery ← Negative Affect	0.821	0.028	29.814	< 0.001	0.893
Distressed ← Negative Affect	0.882	0.027	32.514	< 0.001	0.919
Upset ← Negative Affect	0.892	0.026	33.700	< 0.001	0.929
Afraid ← Negative Affect	0.921	0.028	33.071	< 0.001	0.923
Scared ← Negative Affect	0.844	0.027	30.940	< 0.001	0.904
Sat.3 ← Satisfaction	1.000 (fixed)	—	—	—	0.898
Sat.2 ← Satisfaction	0.999	0.038	26.205	< 0.001	0.899
Sat.1 ← Satisfaction	1.056	0.041	25.702	< 0.001	0.889
Leal.4 ← Loyalty	0.916	0.025	36.759	< 0.001	0.936
Leal.3 ← Loyalty	0.9998	0.027	37.512	< 0.001	0.941
Leal.2 ← Loyalty	0.958	0.031	31.394	< 0.001	0.894
Leal.1 ← Loyalty	1.000 (fixed)	—	—	—	0.940
Rec.3 ← Recommendation	1.000 (fixed)	—	—	—	0.903
Rec.2 ← Recommendation	1.058	0.038	27.843	< 0.001	0.909
Rec.1 ← Recommendation	1.005	0.036	27.721	< 0.001	0.907

Note: For fixed marker loadings, the unstandardized estimate is constrained to 1.000, and S.E., C.R., and p are not applicable. Leal.3 is a freely estimated loading; its unstandardized estimate is shown to four decimal places (0.9998) because it rounds to 1.000 at three decimals. The unstandardized regression weights, standard errors, and critical ratios were rechecked directly against the archived July 2024 AMOS output. Standardized estimates were obtained from the verified covariance solution using the final 400-case analytic dataset; this solution reproduces the archived AMOS unstandardized structural weights and CMIN/DF.

Table 4. Reliability and convergent validity

Construct	Cronbach's α	Composite Reliability	AVE
Positive Affect	0.979	0.979	0.824
Negative Affect	0.980	0.981	0.835
Satisfaction	0.928	0.924	0.802
Loyalty	0.961	0.961	0.861
Recommendation	0.933	0.932	0.821

Table 5. Discriminant validity of the measurement model (HTMT)

Construct	Positive Affect	Negative Affect	Satisfaction	Loyalty	Recommendation
Positive Affect					
Negative Affect	0.274				
Satisfaction	0.492	0.395			
Loyalty	0.441	0.223	0.510		
Recommendation	0.418	0.250	0.540	0.703	

model ($\chi^2(395) = 489.783$, CFI = 0.994, TLI = 0.993, RMSEA = 0.025, SRMR = 0.021). The chi-square difference was substantial ($\Delta\chi^2(10) = 8,897.870$, $p < 0.001$). This comparison is inconsistent with a single common factor accounting for the covariance structure, although it does not eliminate the possibility of residual common-method variance.

Overall fit of the structural SEM was generally satisfactory when evaluated across complementary indices: $\chi^2(400) = 545.123$, $p < 0.001$; CMIN/DF = 1.363; CFI = 0.991; TLI = 0.990; RMSEA = 0.030, 90% CI [0.023, 0.036]; SRMR = 0.081; GFI = 0.916; AGFI = 0.903; and NFI = 0.966. The statistically significant χ^2 is expected to be sensitive to sample size, while the incremental and approximate fit indices indicate close overall correspondence between the model and the observed covariance structure. SRMR is close to the conventional 0.08 guideline and is considered alongside the other fit indices rather than in isolation.

Table 6. Overall structural SEM fit indices

Index	Value
χ^2	545.123
Degrees of freedom	400
Model-test p-value	< 0.001
CMIN/DF	1.363
CFI	0.991
TLI	0.990
RMSEA	0.030
RMSEA 90% CI	[0.023, 0.036]
SRMR	0.081
GFI	0.916
AGFI	0.903
NFI	0.966

Taken together, the measurement diagnostics, robustness checks, global fit statistics, and structural coefficients indicate that the hypothesized covariance structure is consistent with the observed data, subject to the cross-sectional, recall, sampling, and common-method limitations described below.

Hypothesis testing was based on the five prespecified structural paths. Magnitude comparisons use the standardized coefficients rather than the unstandardized regression weights. All five hypotheses were supported. The model explains 28.0% of the variance in Satisfaction, 25.4% in Loyalty, and 53.2% in Recommendation.

H1a was supported: Positive Affect was positively associated with Satisfaction ($B = 0.372$, $SE = 0.040$, $CR = 9.274$, $\beta = 0.441$, $p < 0.001$). *H1b* was also supported: Negative Affect was negatively associated with Satisfaction ($B = -0.205$, $SE = 0.032$, $CR = -6.330$, $\beta = -0.292$, $p < 0.001$). On the standardized scale, the Positive Affect association was larger in absolute magnitude.

H2 was supported: Satisfaction was positively associated with Loyalty ($B = 0.677$, $SE = 0.065$, $CR = 10.347$, $\beta = 0.504$, $p < 0.001$).

H3 was supported: Satisfaction was positively associated with Recommendation ($B = 0.303$, $SE = 0.057$, $CR = 5.333$, $\beta = 0.248$, $p < 0.001$).

H4 was supported: Loyalty was positively associated with Recommendation ($B = 0.521$, $SE = 0.043$, $CR = 12.053$, $\beta = 0.572$, $p < 0.001$).

The original specification did not estimate direct paths from Positive Affect or Negative Affect to Loyalty or Recommendation. The study therefore does not claim a formal mediation test or classify mediation as full or partial; Satisfaction is treated as an intermediate endogenous construct in the theorized sequence.

4. DISCUSSION

This section interprets the structural results in relation to prior research and considers their theoretical and managerial implications. The discussion us-

es standardized coefficients when comparing path magnitudes and retains the non-causal interpretation required by the cross-sectional design.

Both affect dimensions were associated with Satisfaction in the expected directions. Positive Affect showed the larger association on the standardized scale ($\beta = 0.441$) compared with Negative Affect in absolute magnitude ($\beta = -0.292$). This pattern is consistent with service research linking affective responses to satisfaction (Liljander & Strandvik, 1997; Ladhari et al., 2011), while extending that evidence to a PANAS-based model of US branch banking.

Satisfaction was associated with Loyalty ($\beta = 0.504$) and Recommendation ($\beta = 0.248$), and Loyalty showed the strongest direct association with Recommendation ($\beta = 0.572$). These results are consistent with the established satisfaction-loyalty relationship in retail banking (Beerli et al., 2004; Yang & Peterson, 2004) and with evidence that satisfaction and loyalty contribute to positive recommendation behavior (Ladhari et al., 2011). The R^2 values indicate that the model accounts for 28.0% of Satisfaction, 25.4% of Loyalty, and 53.2% of Recommendation.

The theoretical contribution is therefore not a new validation of PANAS, but its application as a two-dimensional affect measure inside a parsimonious customer-experience SEM. The measurement results support the distinctiveness of affect, satisfaction, loyalty, and recommendation, while the structural results quantify their associations with-

out implying temporal or causal ordering beyond the model specification.

From a managerial perspective, the findings support measuring affective cues alongside conventional satisfaction and service-quality metrics in branch interactions. Because the PANAS question captures generalized recalled affect rather than a specific recent event, the measure is better suited to diagnosing the overall affective tone associated with branch visits than to evaluating a single employee encounter.

Banks could use brief affective measures to identify branches or interaction patterns associated with enthusiasm, attention, anxiety, or irritation, and then test service-design, communication, empathy, or recovery interventions in field settings. The present evidence identifies relationships worth investigating but does not establish that any specific managerial intervention will cause higher loyalty or advocacy.

AI-based personalization, chatbots, and omnichannel integration remain possible extensions rather than tested implications. These technologies and channel-integration mechanisms were not measured in the present model and should be evaluated directly in future research before causal or prescriptive claims are made.

Overall, the results suggest that generalized affect associated with branch interactions is meaningfully related to satisfaction and that satisfaction and loyalty are in turn related to recommendation. This provides a focused basis for further causal and channel-specific investigation.

CONCLUSION

This study aimed to estimate the associations among positive affect, negative affect, satisfaction, loyalty, and recommendation in US retail branch banking using a covariance-based SEM. All five hypothesized paths were statistically significant: Positive Affect was positively associated with Satisfaction ($\beta = 0.441$), Negative Affect was negatively associated with Satisfaction ($\beta = -0.292$), Satisfaction was associated with Loyalty ($\beta = 0.504$) and Recommendation ($\beta = 0.248$), and Loyalty was associated with Recommendation ($\beta = 0.572$). The model explained 28.0% of the variance in Satisfaction, 25.4% in Loyalty, and 53.2% in Recommendation, with satisfactory overall model fit.

Several limitations qualify the findings. The design is cross-sectional, so temporal precedence and causality cannot be established. All substantive measures are self-reported by the same respondents; although the Harman diagnostic and the poor fit of the single-factor CFA reduce concern that one common factor dominates the covariance structure, residual common-method variance cannot be ruled out.

In addition, the branch PANAS item did not specify a recent encounter or recall period, and eligibility did not require a recent branch visit. The affect scores therefore reflect generalized recalled affect associated with branch interactions rather than emotions tied to a particular service event.

The online-panel sample was quota-balanced across five demographic variables but was not drawn from a known probability sampling frame, and no post-stratification weighting was applied. The study is also limited to the United States and to branch-related affect, which constrains generalization to other countries, digital-only services, fintech, private banking, or other interaction channels.

Finally, the structural specification does not include direct paths from affect to Loyalty or Recommendation. The study therefore does not claim formal mediation or distinguish full from partial mediation.

Future research should use event-anchored designs that ask respondents about a specific recent branch interaction and define a recall period, alongside longitudinal or experimental designs capable of testing temporal and causal effects. Replications across countries and banking segments could assess the stability of the measurement and structural relationships.

Channel-specific studies could compare branch, telephone, mobile, and online interactions without aggregating affect across channels and could test measurement invariance directly. Research on artificial intelligence, personalization, and omnichannel integration should measure those mechanisms explicitly rather than extrapolating them from branch data.

Future mediation studies should also pre-specify direct affect-to-outcome paths and report direct, indirect, and total effects with bootstrap confidence intervals. These extensions would provide a stronger basis for causal explanation and managerial intervention.

AUTHOR CONTRIBUTIONS

Conceptualization: Carlos Alberto Espinosa Fernández, Ainhoa Rodríguez Oromendía, Iñigo Tejera Martín.

Data curation: Carlos Alberto Espinosa Fernández, Ainhoa Rodríguez Oromendía, Iñigo Tejera Martín.

Formal analysis: Carlos Alberto Espinosa Fernández, Ainhoa Rodríguez Oromendía, Iñigo Tejera Martín.

Investigation: Carlos Alberto Espinosa Fernández, Ainhoa Rodríguez Oromendía, Iñigo Tejera Martín.

Methodology: Carlos Alberto Espinosa Fernández, Ainhoa Rodríguez Oromendía, Iñigo Tejera Martín.

Project administration: Carlos Alberto Espinosa Fernández, Ainhoa Rodríguez Oromendía, Iñigo Tejera Martín.

Resources: Carlos Alberto Espinosa Fernández, Ainhoa Rodríguez Oromendía, Iñigo Tejera Martín.

Software: Carlos Alberto Espinosa Fernández, Ainhoa Rodríguez Oromendía, Iñigo Tejera Martín.

Supervision: Carlos Alberto Espinosa Fernández, Ainhoa Rodríguez Oromendía, Iñigo Tejera Martín.

Validation: Carlos Alberto Espinosa Fernández, Ainhoa Rodríguez Oromendía, Iñigo Tejera Martín.

Visualization: Carlos Alberto Espinosa Fernández, Ainhoa Rodríguez Oromendía, Iñigo Tejera Martín.

Writing – original draft: Carlos Alberto Espinosa Fernández, Ainhoa Rodríguez Oromendía, Iñigo Tejera Martín.

Writing – reviewing & editing: Carlos Alberto Espinosa Fernández, Ainhoa Rodríguez Oromendía, Iñigo Tejera Martín.

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APPENDIX A. Survey instrument

The survey was administered in English in April 2024 through the Pollfish online panel to US adult retail banking customers. The complete administered instrument is reproduced below. It comprises nineteen items organized in five blocks. Items 1 to 4 (gender, age, education, and annual income) were captured from Pollfish panellist-profile attributes and were not re-asked within the survey; items 5 to 19 were presented to respondents. The present study analyses the branch PANAS block (Item 8). Item 8 did not specify a particular recent encounter or recall period, so its scores are interpreted as generalized recalled affect associated with branch interactions. The telephone PANAS block (Item 9) is retained here because it formed part of the administered questionnaire, but it was not included in the analytic dataset or SEM used in this article.

Block 1. Respondent profile

Items 1 to 4 below were captured from the Pollfish panel profile and not re-asked within the survey.

Item 1. Gender

Female / Male / Prefer not to say.

Item 2. Age

18–24 / 25–34 / 35–44 / 45–54 / 55 or older.

Item 3. Level of education (highest completed)

Middle school / High school / Vocational or technical college / University / Postgraduate.

Item 4. Annual income level

Less than US\$25,000 / From US\$25,000 to US\$49,999 / From US\$50,000 to US\$74,999 / From US\$75,000 to US\$99,999 / From US\$100,000 to US\$124,999 / From US\$125,000 to US\$149,999 / More than US\$150,000 / Prefer not to say.

Items 5 to 19 below were presented to respondents in the Pollfish interface.

Item 5. Which environment better describes where you live?

A city with less than 5,000 residents / A city with a population of 5,000 to 20,000 / A city with a population of 20,001 to 100,000 / A city with a population of 100,001 to 1 million / A city with a population exceeding 1 million residents.

Item 6. Which bank do you primarily operate with? Your main bank is: _____

[Open-ended text response.]

Item 7. What is the reason for your most frequent visits to your bank branch?

Personal reasons / Professional reasons.

Block 2. Emotions (PANAS)

The next two items asked respondents to rate, on a five-point intensity scale, the twenty PANAS emotions in two interaction contexts. Item 8 referred to visiting a branch and speaking with a bank employee, without a specified recent encounter or recall period; Item 9 referred to telephone contact. Only Item 8 was used in the present branch-banking analysis. Positive-affect items are listed first (Enthusiastic, Interested, Determined, Excited, Inspired, Alert, Active, Strong, Proud, Attentive) and negative-affect items second (Scared, Afraid, Upset, Distressed, Jittery, Nervous, Ashamed, Guilty, Irritable, Hostile).

Item 8. Rate the level at which you experience the following emotions when visiting a bank branch and speaking with a bank employee:

Table A1. PANAS items for branch interactions

Emotions	1 – Very slightly or not at all	2 – A little	3 – Moderately	4 – Quite a bit	5 – Extremely
Enthusiastic					
Interested					
Determined					
Excited					
Inspired					
Alert					
Active					
Strong					
Proud					
Attentive					
Scared					
Afraid					
Upset					
Distressed					
Jittery					
Nervous					
Ashamed					
Guilty					
Irritable					
Hostile					

Item 9. Rate the level at which you experience the following emotions when speaking with a bank employee by phone:

Table A2. PANAS items for telephone interactions

Emotions	1 – Very slightly or not at all	2 – A little	3 – Moderately	4 – Quite a bit	5 – Extremely
Enthusiastic					
Interested					
Determined					
Excited					
Inspired					
Alert					
Active					
Strong					
Proud					
Attentive					
Scared					
Afraid					

Table A2 (cont.). PANAS items for telephone interactions

Emotions	1 – Very slightly or not at all	2 – A little	3 – Moderately	4 – Quite a bit	5 – Extremely
Upset					
Distressed					
Jittery					
Nervous					
Ashamed					
Guilty					
Irritable					
Hostile					

Analytic

note. Item 9 was an ancillary channel measure and was not analysed in this article. The SEM uses the twenty PANAS indicators from Item 8 only, together with three satisfaction, four loyalty, and three recommendation indicators, for a total of 30 observed indicators. No branch-phone averaging or aggregation was performed.

Block 3. Satisfaction

The three items in this block were measured on a five-point Likert scale: 1 = Strongly disagree; 2 = Disagree; 3 = Neither agree nor disagree; 4 = Agree; 5 = Strongly agree.

Item 10. My bank's services are satisfactory to me

Item 11. My bank meets my needs and exceeds my expectations

Item 12. Overall, I am more satisfied with my chosen bank than with other banks

Block 4. Loyalty

The four items in this block were measured on the same five-point Likert scale as Block 3 (1 = Strongly disagree to 5 = Strongly agree)

Item 13. I am a loyal customer of my bank

Item 14. I will continue using this bank, even if price commissions increase

Item 15. I will switch to a competitor if I experience a problem with my bank. (This item was reverse-coded before analysis)

Item 16. Even if the service of another bank were superior, I would continue using this bank

Block 5. Recommendation

The three items in this block were measured on the same five-point Likert scale as Block 3 (1 = Strongly disagree to 5 = Strongly agree)

Item 17. I speak positively about my bank to others

Item 18. I share my experiences with my bank with my friends and family

Item 19. I recommend my bank to others