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Research Article

Investigating the Relationship Between Brand Equity and Customer Loyalty the Moderating Effect of Customer Satisfaction in the Telecom Industry

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Abstract

The study explores the connection between brand equity and customer loyalty in the telecom industry. It specifically examines how customer satisfaction plays a moderating role in this relationship. The research employed structural equation modeling and involved 386 Ethio telecom customers. Several aspects were evaluated, including reliability, convergent validity, and sample adequacy. The study's findings highlight a strong positive correlation between brand equity and customer loyalty within the telecom industry. Factors such as positive brand image, perceived quality, brand awareness, and brand associations were found to have significant influences on customer loyalty. Furthermore, customer satisfaction was identified as a moderator, enhancing the positive impact of brand equity on loyalty. Based on the results, the study emphasizes the importance of brand equity and customer satisfaction in fostering loyalty in the telecom industry. It suggests that telecom companies should invest in building a strong brand image, improving perceived quality, increasing brand awareness, and cultivating favorable brand associations. Policymakers and regulators are also encouraged to create a competitive telecom market that promotes innovation, high-quality service delivery, and reasonable pricing. The practical implications of these findings are significant for the industry. They underscore the need for strong brand equity strategies and the delivery of exceptional customer experiences. By prioritizing these aspects, telecom companies can enhance customer loyalty and gain a competitive advantage in the market.

Keywords

Brand Equity, Loyalty, Satisfaction, Mediator, Customer

1. Introduction

According to some, branding is the cornerstone of service marketing in the twenty-first century [11]. Brand equity is a potent instrument for increasing marketing productivity, and marketing managers can measure brand performance and customer happiness by assessing brand equity [74]. Brand equity is one of the most crucial marketing ideas, both in theory and practice [73]. When a customer responds more favorably to marketing efforts (such as advertising and promotion) for a brand than they do for an unbranded product or service in the same category, this shows that the brand has

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positive brand equity [45]. As the primary means of differentiation from other competing market products, brands are seen as essential to the company's success [7]. According to [44], In many businesses, branding is the primary factor that creates preference and buy intentions. Customer equity rather than current sales or market share may be a more accurate indicator of a company's performance [17].

Building good relationships with customers is one of the fundamental tenets of successful companies, thus they strive to instill trust in their audience [41]. Attracting new consumers is important for an organization's success today, and keeping old customers will cost more money. In reality, the best customers are those who are loyal to the business. In general, it can be claimed that most big businesses today work to increase client loyalty and view it as a strategic goal for themselves [71].

Brand equity encourages customer loyalty, which creates long-lasting, lucrative connections. It has been proposed that several constructs are likely to have an impact on the emergence of a devoted clientele [75]. Loyalty has been widely researched in the domain of marketing [14]. Past research recognized that certain predictors of levels of loyalty could exist [75]. Beginning and maintaining a relationship with customers, buying goods and services frequently, placing a high value on purchases, tolerating higher prices, recommending products to others, and remaining immune to the competition's allure are all ways to build customer loyalty [26]. Customer loyalty has a powerful impact on a firm's performance and is considered by many companies as an important source of competitive advantage [16]. Because loyal customers are any company's most valuable asset, managers must connect with them, communicate with them effectively, and respond quickly to their complaints. Loyal customers will not only make repeat purchases but also refer their friends and family to the business [42]. However, for a business to survive and thrive in the marketplace, it needs brand-loyal clients who are resistant to switching to competing products [68]. Brand loyalty is a marketing term that often refers to consumer pleasure [8].

Customer satisfaction leads to competitive advantages and finally customer loyalty and repeat purchase. Increased sales, lower transaction costs, and decreased price elasticity among repeat customers are all advantages of customer satisfaction [52]. Customer satisfaction is at the core of marketing and has been identified as a key predictor of repeat purchases, meaning the more satisfied a customer is, the more likely it is that they would return to that particular retailer [43]. Furthermore, certain studies were conducted in diverse contexts, such as manufacturing, banking, and consumer products, resulting in contextual gaps. Furthermore, no research has been conducted in the study area to investigate the relationship between brand equity, customer loyalty, and customer satisfaction. As a result, this study addresses a knowledge gap by investigating the effect of brand equity on customer loyalty in the Ethio-telecom industry.

For a variety of stakeholders, it is crucial to investigate how brand equity and customer loyalty, as well as the moderating role of customer satisfaction, relate to the telecom industry. Understanding the link between brand equity and customer loyalty can help telecom companies create branding strategies that will boost client retention and loyalty. They can also find opportunities for improvement in their customer service and overall customer experience by understanding the moderating impact of customer satisfaction on this connection. This study can help customers better understand how brand equity and client satisfaction can affect their loyalty to a particular telecom provider. It may also enable them to select a telecom provider with greater knowledge. This study can add to the knowledge of the connections between brand equity, customer loyalty, and customer satisfaction in the telecom industry for researchers and academics.

Research Questions

The following research questions have been developed to carry out this research.

What is the level of brand equity among customers in the Telecom Industry in the Hossana district?

How loyal are customers in the Telecom Industry Hossana district?

Is there a relationship between brand equity and customer loyalty in the Telecom Industry?

Does customer satisfaction moderate the relationship between brand equity and customer loyalty in the Telecom Industry?

2. Literature Review

2.1. Brand Equity

The word "brand equity" has become one of the most important concepts in marketing literature ever since the (1980s). Brand equity is the whole benefit that the customer receives from purchasing the brand, including both functional and symbolic benefits [54]. Therefore, [1] According to the definition of brand equity, it is "a collection of resources, including name recognition, devoted patrons, perceived quality, and associations, that are connected to the brand and enhance the value of the offered good or service." As opposed to that, [45], Brand equity is defined as "the impact of the brand on consumers' response to the marketing activities associated with a specific product."

Dimensions of Brand Equity

Perceived quality is characterized as the complete superiority that encourages consumers to purchase a product [1]. According to [10], Color, flavor, and appearance are examples of quality aspects that might affect perceived quality. The physical and behavioral quality of personnel is regarded as perceived quality in the telecom services sector. Quality is seen as a service image of telecommunications while employee behavior is an image expressed by usefulness and friendly telecom employees [29]. According to the definition

of perceived quality, it refers to the consumer's assessment of an item's overall quality or popularity about the item's image and overall popularity, which ultimately influences the customer to purchase the item [1].

Brand awareness is also defined as "the ability of consumers to differentiate one brand from the other" [67]. Brand awareness measures how quickly consumers can recognize or recall any brand in any category of good or service. Brand awareness, according to Aaker, is the consumer's capacity to identify or recall a brand as a representative of a particular product category [1]. Also claimed that brand awareness influenced the development and strength of brandy, which in turn influenced customer decision-making [45]. Brand recognition serves as a potent indicator of both supplier commitment and product quality [35]. Because achieving high levels of brand awareness typically requires significant supplier expenditure (e.g., in exhibitions or advertising). The supplier spends money now in the hope of recovering it later [46].

Brand loyalty means repeating that this behavior is caused by mental processes. In other words, rather than just being a choice response, recurrent purchasing is a result of mental, emotional, and social standards. Many experts claim that behavioral loyalty alone cannot adequately explain the reasons behind purchases, hence attitude-related factors must be considered [6]. Brand loyalty demonstrates consumer devotion to a brand, which represents an intangible asset and influences the price of a company's goods or services [41]. Though a consumer chooses to buy a certain brand above others, even though alternatives are available, they are demonstrating their brand loyalty, which is a biased behavioral reaction. This behavior is assumed to be a result of how consumers make different types of psychological decisions. [21]).

Brand associations represent the basis for the consumer's decision to buy the brand, and the customer is well informed about the brand [38]. Finding the various points—benefits that set the brand apart from competitors—is what those in charge of establishing a brand image in customers' thoughts are concerned with doing [44].

2.2. Customer Loyalty

Customer loyalty, in the words of the founder and CEO of Loyalty Builders Inc., is "an organization decided measurement of a chance to buy again or not abandon to a competitor." According to many researchers, a customer who constantly makes purchases to suit their needs is considered to be unshakeable [53]. In this regard, [24]. It has been proposed that loyalty includes both attitudinal and behavioral components and that it can be gauged by how strongly relative attitude and repeat business are correlated. Customer loyalty is the preference for one brand over all competitors or the degree to which customers are encouraged to make more frequent purchases as a result of their satisfaction with the goods or

services [62]. Researchers have discovered that devoted customers are more likely to be satisfied customers. Customers stay committed to a business as long as they believe they receive superior services or goods from that business compared to other businesses. In the context of business, loyalty refers to a customer's determination to work with a specific company, which results in repeated purchases of its products and services. Additionally, it leads to referrals of the products and services to friends and business partners [14].

2.3. Customer Satisfaction

Customer satisfaction means customers can get something beyond their expectations [49]. Customer satisfaction is one of the most commonly studied issues in marketing and is crucial for long-term corporate success [60]. Consumers who are satisfied with the goods or services an organization has supplied for them are referred to as satisfied consumers. Comparing a product's performance to a customer's expectations can also result in sentiments of elation or disappointment in the person [59]. The goal of the customers has always been to experience greater levels of satisfaction from the goods or services they buy. To succeed in the modern marketplace, one must not only create products but also cultivate relationships with customers, which entails providing customers with value that is superior to that of rivals [59]. Because the level of service quality provided by the service provider also affects the customer's level of happiness [33].

2.4. Relationship between Brand Equity and Customer Loyalty

Das (2014) argued that brand equity plays a crucial role in enhancing customer loyalty. [61] and [72] considered perceived quality and loyalty as being strong drivers of brand equity. Some scholars such as [63] argue that any company by learning how to manage its brand equity alongside handling its brand performance, can utilities gain control over all the major elements in the value-creation process that creates customer loyalty.

H1: Brand equity has a significant effect on customer satisfaction.

2.5. Relationship Between Brand Equity and Customer Satisfaction

According to [3], the link between brand loyalty and customer satisfaction. Brand equity is a crucial element in determining consumer pleasure [1] was the first to establish the relationship between perceived quality and brand equity. [50] backed up the idea that perceived quality influences satisfaction among customers and has a direct, favorable relationship with it. Consumer pleasure also rises when their impression of value rises [27]. The research supports the idea that customer satisfaction is a result of perceived value, i.e., that perceived value greatly influences contentment. There is a high likeli-

hood that customer satisfaction can be an antecedent or a result of perceived value.

H2: Brand equity has a significant effect on customer loyalty.

2.6. Relationship Between Customer Satisfaction and Customer Loyalty

Previous studies in the context of services have demonstrated a relationship between satisfaction and loyalty [4]. [58] the study revealed a significant effect of satisfaction on loyalty to the restaurant brand. [12] stated that higher satisfaction would result from trust in the brand. Therefore, customer satisfaction with the said brand is a substantial driver of loyalty.

H3: Customer satisfaction has a significant effect on customer loyalty.

3. Research Design and Methods

3.1. Research Design

Research design is the overall plan for connecting conceptual research problems to pertinent and achievable empirical research [20]. Based on the underlying hypothesis, this study's explanatory research design was used to evaluate the relationship between or among variables [70]. It is more likely to use quantitative data [57]. It made it easier for the researchers to derive unbiased conclusions from the findings [56]. In addition, a quantitative approach was used. A research approach known as a quantitative approach entails the gathering and evaluation of numerical data. This method examines the relationship between variables and runs hypothesis tests using statistical and mathematical methods. The quantitative approach requires data collection to quantify the information and statistical analysis to support or disprove opposing knowledge assertions [20, 48, 51].

3.2. Sources of Data and Collection Methods

An in-depth cross-sectional field investigation was conducted to investigate the proposed hypotheses. Through the use of self-administered questionnaires, information was gathered from customers to test the hypothesis developed and the model definition. There are numerous methods for conducting surveys. However, a typical method for surveys is the questionnaire [39]. It expands the sample's coverage and makes it easier to collect a large amount of data. Therefore, under each concept in the question, there are statements presented, and respondents are asked to express their level of agreement or disagreement using a five-point Likert scale. A Likert scale ranging from "1 strongly disagree" to "5—strongly agree" was used for items describing the variables.

3.3. Sample Size and Sampling Techniques

For this study, 386 respondents (customers) from Ethio Telecom Hossana district were targeted as a sample size that has been determined by using the following formula [69].

$$n = \frac{z2pq}{e2} = \frac{1.962*0.5*0.5}{e2} = 386$$

The sample size for this study was determined using the formula $n = z^2 * p * q / e^2$, where n represents the adequate sample size with a given amount of confidence level (in this case, a 95% confidence level), z represents the table value of the confidence level from the normal distribution table, e represents the researcher's tolerable amount of error, p represents the probability of success (the proportion of the study unit who may give adequate information), and q represents the probability of failure (the proportion of the study unit who may not give adequate information). A convenience sampling technique was used. Convenience sampling, also referred to as accidental or haphazard sampling, is a type of nonprobability or nonrandom sampling in which members of the target population satisfy certain practical criteria, such as easy accessibility, proximity to the study site, availability at a specific time, or willingness to participate, are included for the study [28].

3.4. Methods of Data Analysis

To test the relationships between various variables of brand equity, customer loyalty, and customer satisfaction, a statistical technique for hypothesis testing specifically, regression analysis and structural equation modeling (SEM) were used. SEM is widely used in fields of marketing among others. It is an important method for researchers who want to examine complex relationships among variables and test theoretical models. Structural equation modeling (SEM) is a comprehensive statistical approach to testing hypotheses about relations among observed and latent variables [36]. It is a methodology for representing, estimating, and testing a theoretical network of (mostly) linear relations between variables [65]. SEM tests hypothesized patterns of directional and non-directional relationships among a set of observed (measured) and unobserved (latent) variables [55].

4. Discussion of Findings

4.1. Model Specification

Most applications of structural modeling involve following four consecutive steps [13] Model specification; Identification; Estimation; and testing fit. Model specification is a critical step in SEM, as it determines the validity of the model and the accuracy of the results. It is important to carefully consider the theoretical and empirical evidence when speci-

fying the model, as well as to use appropriate statistical techniques to assess the fit of the model to the data. Researchers specify relationships between observable and latent variables, which are represented by parameters or routes. There are three types of parameters to specify: directional effects, variances, and covariance. The directional effects in Figure 1's structural model are twelve-factor loadings and two path coefficients.

Variances for indicator error linked to the twelve manifest variables, errors related to the unobserved endogenous variable (customer satisfaction), and two unobserved exogenous variables (brand equity and customer loyalty) are estimated. The analyzed model has one covariance (a non-directional relationship between independent latent variables).
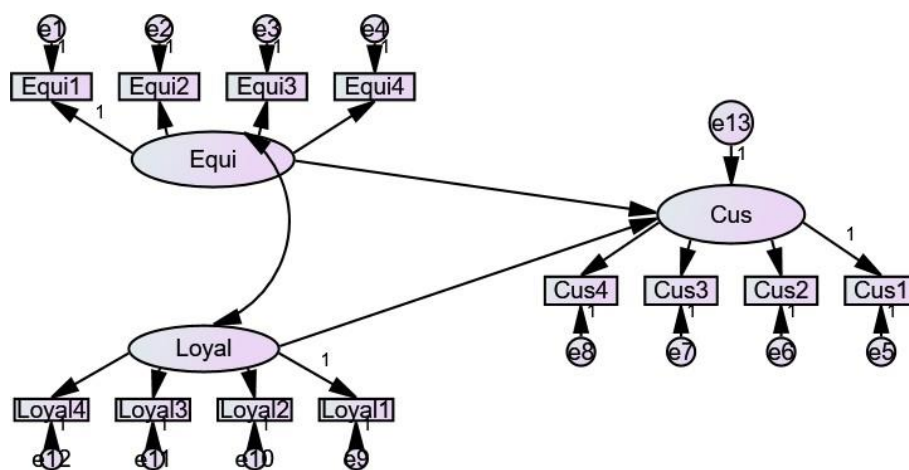

Figure 1. *Structural model.*

4.2. Model Identification

In Amos, the term "model identification" refers to the process of determining if a structural equation model (SEM) is identified, that is, whether it can be estimated and yield useful results. Under identification occurs when the number of parameters exceeds the number of available data points and under identification is often indicated by a warning message or estimation problems. If under identification is detected, it means that the model cannot be identified and further adjustments are required. Over identification occurs when the number of parameters is less than the number of data points, indicating that the model is over identified. Amos automatically estimates the model and provides fit indices to assess model fit. If the model is over identified, it indicates that it can be identified and estimated successfully. As presented by the model in Figure 1 has 12 parameters. In contrast, using the formula $p(p+1)/2$, where p is the number of manifest variables, resulted in the discovery of a total of $12 \times 13/2 = 78$ data points. The analyzed model is therefore over identified.

An additional vital matter in SEM is the sample size. The size of the sample influences the ability of the model to be estimated correctly, as well as the specification error to be identified. One of the most commonly used methods in SEM is the Maximum Likelihood Estimation (MLE). To use MLE appropriately, [25]) recommend a minimum sample size ranging between 100 and 150 respondents. The number of

respondents in this study is 386.

Reliability and validity tests of a construct

Testing for reliability is important as it refers to the consistency across the parts of a measuring instrument [37]. A scale is said to have high internal consistency reliability if the items of a scale "hang together" and measure the same construct [66]. Referring to the importance of validity in tests, [19] state that effective research is impossible or even "worthless" without the presence of validity, though they do recommend against aiming for absolute validity.

Composite Reliability (CR) is a statistical measure used in psychometrics to assess the internal consistency or reliability of a set of items or indicators that are intended to measure a particular construct or latent variable. A composite reliability (C.R.) is calculated for every construct, and then compared with the cut-off value of 0.6 [5]. The C.R. values for customer satisfaction, customer loyalty, and brand equity constructs were 0.845, 0.776, and 0.843, respectively, confirming convergent validity. Average Variance Extracted (AVE) is a statistical measure used in psychometrics to assess the convergent validity of a set of items or indicators that are intended to measure a particular construct or latent variable [32]. The average variance extracted should be higher than the minimum threshold of 0.5. In this analysis, the obtained AVE values for customer satisfaction, customer loyalty, and brand equity were 0.618, 0.503, and 0.581 respectively, so the convergent validity of the construct is still adequate.

Table 1. Reliability and convergent validity.

Predicted constructs	Indicators (items)	Composite Reliability (CR)	Average Variance Extracted (AVE)
Customer satisfaction	Cs1 Cs2 Cs3 Cs4	0.845	0.618
Customer loyalty	Loya1 Loya2 Loya3 Loya4	0.776	0.503
Brand equity	Equi1 Equi2 Equi3 Equi4	0.843	0.581

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 5 iterations.

Collinearity Statistics [31] implies that' multi-collinearity would be suspected if tolerance numbers are below 0.10 or if VIF statistics are 10.0 or greater, there is a signal that a multi-collinearity problem occurs. Alternatively, the VIF number should be 10 and the tolerance value should be more than 0.10. The tolerance for all independent variables is larger than (0.10), and the VIF for independent variables is less than the limited value (10.0), indicating that there is no multi-collinearity between the model's independent variables.

The presence of multicollinearity poses a difficulty in SEM since some tests' findings may be biased. The standard procedure is to compute bivariate correlation or to conduct multiple regression and evaluate tolerance and variance inflation factor (VIF) values.

Table 2. Results of the values for tolerance and VIF from multiple regression analysis.

Variables		Collinearity Statistics	
		Tolerance	VIF
	Equi1	.947	1.056
	Equi2	.682	1.467
	Equi3	.684	1.462
	Equi4	.903	1.107
	Loya1	.925	1.081
	Loya2	.945	1.059
	Loya3	.929	1.077
	Loya4	.975	1.026

Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy

Table 3. KMO and Bartlett's Test.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.555
Bartlett's Test of Sphericity	Approx. Chi-Square	663.262
	df	66
	Sig.	.000

KMO (Kaiser-Meyer-Olkin) and Bartlett's test are both commonly used in exploratory factor analysis (EFA), which is a statistical technique used to identify the underlying structure of a set of variables. The KMO values greater than 5 are adequate and suitable for the analysis of the data For the current study, the KMO test values for all of the factors were greater than 0.5 and Bartlett's test was significant (p=0.000) as mentioned in Table 3, indicated that the data were suitable for factor analysis.

Total variance explained

The table demonstrates the eigenvalues and total variance explained. The extraction method of factor analysis used in this study is principal component analysis. Before extraction, twelve linear components are identified within the data set. After extraction and rotation, there are five distinct linear components within the data set for the eigenvalue > 1. The five factors are extracted accounting for a combined 63.6% of the total variance. It is suggested that the proportion of the total variance explained by the retained factors should be at least 50%. The result shows that 63.6% common variance shared by twelve variables can be accounted by five factors. This initial solution suggests that the final solution will extract not more than five factors. The first component has explained 16.45% of the total variance with an eigenvalue 2.08. The second component has explained a 13.74% variance with an eigenvalue 1.65. The third component has explained 13.4% variance with an eigenvalue 1.57. The fourth component has explained an 11.08% variance with an eigenvalue of 1.27. The fifth component has explained 8.9% variance with an eigenvalue of 1.04.

Table 4. Total variance.

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.087	17.394	17.394	1.975	16.456	16.456
2	1.653	13.772	31.166	1.650	13.748	30.204
3	1.576	13.135	44.301	1.610	13.417	43.621
4	1.274	10.620	54.920	1.330	11.084	54.705
5	1.043	8.693	63.613	1.069	8.908	63.613
6	.902	7.515	71.128			
7	.846	7.054	78.182			
8	.734	6.118	84.300			
9	.654	5.453	89.753			
10	.495	4.126	93.879			
11	.409	3.409	97.288			
12	.325	2.712	100.000			

Discriminant Validity (using AMOS)

The criterion is to assess discriminant validity using [32] criteria this method compares the square root of the average variance extracted (AVE) with the correlation of latent constructs. A latent construct should explain better the variance of its own indicator rather than the variance of other latent constructs. Therefore, the square root of each construct's AVE should have a greater value than the correlations with other latent constructs [34]

If the squared correlation between two constructs is less than their AVE scores, then it suggests that the constructs are distinct from each other and have discriminant validity. This means that the constructs are not measuring the same underlying concept, and that they are distinct and separate constructs. The study's results support the idea that the measures used in the study were able to accurately and reliably measure the intended constructs.

Table 5. Discriminant validity.

Correlation	Factor Correlations	Comparison of Squared Correlation with AVE	Discriminant Validity
Equi <--> Loyal	0.026	0.000676 < AVE	Established

4.3. Model Estimation

The process of choosing the parameter estimates that best fit the proposed structural equation model (SEM) to the observed data is known as model estimation in AMOS (Analysis of Moment Structures). Finding the values of the model parameters that minimize the difference between the implied covariance matrix of the model and the observed covariance matrix (e.g., path coefficients, factor loadings, and error variances) is the process of estimation. The parameters of a SEM can be estimated using a variety of estimation techniques offered by AMOS. Maximum likelihood estimation (MLE) is the estimate technique that is most frequently employed in AMOS. Aiming to maximize the likelihood of witnessing the data given the model, MLE seeks out the set of parameter estimates. The likelihood gauges how accurately the model can forecast the observed data.

In AMOS, when estimating a structural equation model (SEM), both unstandardized and standardized values of the estimates are reported. These values are similar to the unstandardized B weights and standardized betas in regression analysis but serve slightly different purposes. Unstandardized estimates, sometimes referred to as unstandardized coefficients or path coefficients, show the direct effects or interactions between variables in their original measure. They are normally reported in the units of measurement of the variables

involved. The critical ratio in AMOS helps researchers determine the significance of the estimated parameters in a structural equation model. It provides a statistical test to evaluate the strength and reliability of the relationships between variables in the model. If the calculated critical ratio exceeds the critical value, it indicates that the estimated parameter is statistically significant at the chosen level of significance. For most of them, the C.R. exceeded the value of ±1.96, suggesting that all the parameters in the model were statistically significant. A detailed elaboration of each of the parameters/constructs analyzed in the model is given in the segment discussions of results.

We can draw the conclusion that almost all parameter estimations exhibit the proper sign and size and are consistent with the underlying theory in terms of their viability. Standard errors are used to estimate the uncertainty associated with the estimated parameters. They provide a measure of how much the estimated parameter values may vary if the analysis were repeated on a different sample from the same population. Reliable standard errors help ensure accurate estimation of the model's parameters. The critical ratio indicates the number of standard errors the estimated parameter is away from zero. A larger absolute value of the critical ratio suggests a more significant relationship between the variables in the model. The C.R. for the most of them was higher than the value of 1.96, indicating that the majority of the model's parameters were statistically significant.

Table 6. Regression Weights (Unstandardized).

			Estimate	S.E.	C.R.	P
Cus	<---	Equi	1.151	.115	1.311	.0190
Cus	<---	Loyal	-1.089	.061	-1.448	.0148
Equi4	<---	Equi	1.000			

			Estimate	S.E.	C.R.	P
Equi3	<---	Equi	6.334	2.951	2.146	.032
Equi2	<---	Equi	4.821	2.106	2.289	.022
Equi1	<---	Equi	.790	.438	1.806	.071
Cs1	<---	Cus	1.000			
Cs2	<---	Cus	3.488	1.131	3.084	.002
Cs3	<---	Cus	6.387	2.132	2.995	.003
Cs4	<---	Cus	3.008	1.005	2.993	.003
loya4	<---	Loyal	1.000			
Loya3	<---	Loyal	1.036	.518	2.001	.045
Loya2	<---	Loyal	.594	.300	1.980	.048
Loya1	<---	Loyal	.330	.206	1.604	.109

Customer satisfaction and brand equity: The estimated coefficient is 1.151, with a critical ratio of 1.311 and a p-value of 0.0190. Since the p-value (0.0190) is less than 0.05, we can conclude that the relationship between customer satisfaction and brand equity is statistically significant at the 5% level. Customer satisfaction and customer loyal: The estimated coefficient is -1.089, with a critical ratio of -1.448 and a p-value of 0.0148. The p-value (0.0148) is less than 0.05, indicating that the relationship between Customer satisfaction and customer loyal is statistically significant at the 5% level. Brand loyalty and brand equity: The estimated coefficient is 6.334, with a critical ratio of 2.146 and a p-value of 0.032. The p-value (0.032) is less than 0.05, suggesting that the relationship between Brand loyalty and brand equity is statistically significant at the 5% level. Brand awareness and brand equity: The estimated coefficient is 4.821, with a critical ratio of 2.289 and a p-value of 0.022. The p-value (0.022) is less than 0.05, indicating that the relationship between Brand awareness and brand equity is statistically significant at the 5% level. Perceived quality and brand equity: The estimated coefficient is 0.790, with a critical ratio of 1.806 and a p-value of 0.071. The p-value (0.071) is greater than 0.05, so we do not have enough evidence to conclude that the relationship between Perceived quality and brand equity is statistically significant at the 5% level. Customer Service and customer satisfaction: The estimated coefficient is 3.488, with a critical ratio of 3.084 and a p-value of 0.002. The p-value (0.002) is less than 0.05, indicating that the relationship between Customer Service and customer satisfaction is statistically significant at the 5% level. Timeliness and customer satisfaction: The estimated coefficient is 6.387, with a critical ratio of 2.995 and a p-value of 0.003. The p-value (0.003) is less than 0.05, suggesting that the relationship between Timeliness and customer satisfaction is statistically significant at the 5% level.

Value for Money and customer satisfaction: The estimated coefficient is 3.008, with a critical ratio of 2.993 and a p-value of 0.003. The p-value (0.003) is less than 0.05, indicating that the relationship between Value for money and customer satisfaction is statistically significant at the 5% level. Brand reputation and customer loyalty: The estimated coefficient is 1.036, with a critical ratio of 2.001 and a p-value of 0.045. The p-value (0.045) is less than 0.05, suggesting that the relationship between Brand reputation and customer loyalty is statistically significant at the 5% level. Convenience and accessibility and customer loyalty: The estimated coefficient is 0.594, with a critical ratio of 1.980 and a p-value of 0.048. The p-value (0.048) is less than 0.05, indicating that the relationship between Convenience and accessibility and customer loyalty is statistically significant at the 5% level. Trust and customer loyalty: The estimated coefficient is 0.330, with a critical ratio of 1.604 and a p-value of 0.109. The p-value (0.109) is greater than 0.05, so we do not have enough evidence to conclude that the relationship between Trust and customer loyalty is statistically significant at the 5% level.

4.4. Model Evaluation (Model Fit)

The primary goal of model fit in AMOS (Analysis of Moment Structures) is to judge how well a proposed structural equation model (SEM) matches the observed data. The degree to which the implied covariance matrix and the observed covariance matrix match is referred to as model fit. In order to determine if a theoretical model accurately captures the relationships between the observable variables, model fit assessment is essential in SEM. If the hypothesized linkages do not adequately reflect the underlying structure under study, the model may not be fitting the data very well.

Table 7. *Model Fit Summary.*

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	38	38.458	40	.540	.961
Saturated model	78	.000	0		
Independence model	12	671.694	66	.000	10.177

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.021	.984	.969	.505
Saturated model	.000	1.000		
Independence model	.100	.784	.745	.664

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.943	.906	1.002	1.004	1.000
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA (Root Mean Square Error of Approximation)

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.000	.000	.033	.999
Independence model	.154	.144	.165	.000

Fit index	This research value	Recommended value
x 2 (p-value)	0.54	≥ 0.05
CMIN/df	0.961	≤ 3
SRMR	0.021	≤ 0.08
GFI	0.984	≥ 0.9
IFI	1.002	≥ 0.9
TLI	1.004	≥ 0.9
CFI	1.000	≥ 0.9
RMSEA	0.000	≤ 0.08

Source: [47].

Chi-square (χ2) test: This is a statistical test that compares the observed data with the predicted data based on the model. A significant chi-square value indicates that the model is not a good fit for the data but a non-significant chi-square value suggests a good fit. Root Mean Square Error of Approximation (RMSEA): This index measures the discrepancy between the model-implied covariance matrix and the observed covariance matrix. A lower RMSEA value indicates a better

model fit, with values less than 0.08 indicating a good fit. GFI is an index that measures the proportion of variance and co-variance in the data that are accounted for by the model. A GFI value of 0.90 or higher is generally considered to indicate a good fit, although some researchers may use a higher or lower cutoff depending on their specific research context. Comparative Fit Index (CFI): The CFI [9] is a fit index that gauges how well the proposed model fits in comparison to a reference model. This index compares the fit of the specified model with the fit of a null model (i.e., a model with no relationships between variables). A CFI value of 0.9 or higher indicates a good fit. Tucker-Lewis Index (TLI): This is another index that compares the fit of the specified model with the fit of a null model. A TLI value of 0.9 or higher indicates a good fit. Standardized Root Mean Square Residual (SRMR): The RMS [15] offers a measurement of the poor population fit with a correction for the models sparse. This index measures the average discrepancy between the observed and predicted covariance matrices. A lower SRMR value indicates a better model fit, with values less than 0.08 indicating a good fit.

4.5. Hypotheses Test Results

The present study, which was conducted in the telecom industry, reveals that the investigating the relationship between brand equity and customer loyalty on the moderating effect of customer satisfaction. This part thoroughly presents the findings of the hypotheses following the goals of the study. The crucial ratio (t), significance level (p-value), and estimated value all play a role in the choice of whether to accept or reject the hypothesis. For a regression weight, the predicted route parameter is significant at the 05 level when the crucial ratio (t) is greater than 1.96. In contrast, the positive sign of denotes a favorable correlation between the variables [33].

Hypothesis H1 was formulated to determine whether brand equity has a significant effect on customer satisfaction. From the result of the analysis, the researchers found that brand equity has a significant effect on customer satisfaction. Moreover, the significance value is below 0.05 (p, 0.0196) which indicates a considerable effect. Therefore, these values provide a ground to accept the hypothesis formulated. The finding is supported by other studies like [2].

Hypothesis H2 was formulated to identify how brand equity has a significant effect on customer loyalty.

Customers are more inclined to adopt a positive mindset and form an emotional bond with a company when they believe it to have strong brand equity. Customers develop trust and loyalty as a result of this favorable perception, which encourages advocacy and repeat business. in the regression table, the p-value is less than 0.05, therefore, we can have confidence in the results and conclude that there is a statistically significant association between the variables. Moreover, results are consistent with [18] findings, that there is a significant and positive relationship between brand equity and loyalty toward the brand in the telecommunication services

industry.

Hypothesis H3 is the other hypothesis which states the significant effect of customer satisfaction on brand loyalty. Hence, it can be said that customer satisfaction positively and significantly affects overall customer loyalty with a p-value of less than 0.05. Therefore, hypothesis H3 is supported. Customers give more importance to service quality in the telecommunication industry & customer satisfaction and loyalty programs also have a significant impact on customer loyalty [64]. Satisfaction is also studied as the predictor of loyalty [30].

5. Conclusion

This research examines the relationship between brand equity and customer loyalty the moderating effect of customer satisfaction in the telecom industry. Structural equation modeling (SEM) was used on a sample of 386 Ethio telecom industry consumers to achieve the primary goal of this study. Outliers and multicollinearity were checked for in the data, and the reliability and convergent validity of the constructs were evaluated using Cronbach's alpha. Convergent and discriminant validity and the Kaiser Meyer-Olkin (KMO) measure of sample adequacy was also evaluated.

The research study aimed to investigate the relationship between brand equity and customer loyalty in the telecom industry, with a specific focus on the moderating effect of customer satisfaction. Through an in-depth analysis of relevant literature and a comprehensive empirical study, several key findings have emerged.

The telecom business, the study discovered a substantial positive association between brand equity and customer loyalty. This suggests that improved consumer loyalty is influenced by a strong and positive brand image, perceived quality, brand awareness, and brand associations. Customers who have been loyal to a telecom company in the past are more inclined to stay with them.

The study found that the relationship between brand equity and customer loyalty is significantly moderated by consumer satisfaction. Enhancing brand equity's beneficial effects on patron loyalty is customer satisfaction. Customers' perceptions of increased levels of satisfaction with the telecom firm increase the impact of brand equity on their loyalty. This implies that devoted consumers are more likely to become happy with a brand that has significant brand equity.

Overall, the results show how crucial brand equity and customer satisfaction are to nurturing consumer loyalty in the telecom sector. Developing a strong brand image, raising perceived quality, raising brand awareness, and developing favorable brand associations are all things that telecom companies should invest in. These efforts can result in increased customer loyalty and long-term success in the aggressive telecom market when joined with the delivery of excellent customer satisfaction.

6. Recommendations and Policy Implication

Though this study concentrated on the telecom sector, it offers doors for future research to explore brand equity, customer loyalty, and customer happiness across several industries. By doing research across a range of industries, we can get a more comprehensive knowledge of how these factors interact and confirm that the conclusions apply outside of the telecom sector. Brand equity, customer loyalty, and customer satisfaction may correlate in different ways depending on the industry and the customer behaviors that they exhibit.

Telecom businesses should concentrate on enhancing and bolstering their brand equity. Consistent brand messaging, strong brand positioning, the provision of high-quality goods and services, and the use of efficient marketing and communication techniques can all help achieve this. Customer loyalty can be positively impacted by developing a strong brand.

The necessity of fostering a competitive telecom market that promotes innovation, high-quality service delivery, and reasonable pricing should be taken into account by policymakers and regulators. Higher levels of customer satisfaction and loyalty can be attributed to regulatory frameworks that support customer protection, openness, and healthy competition.

The study's findings have significant implications for the telecom industry, emphasizing the necessity to prioritize building a solid brand equity strategy while also concentrating on providing outstanding customer experiences. We can better grasp how firms might use these implications in practice by giving them a human face.

7. Limitations and Prospects for Future Researchers

The cross-sectional form of the study offers a momentary picture of the relationship between brand equity, customer satisfaction, and consumer loyalty. Even while it provides useful information on the relationships between these variables, it's crucial to acknowledge its limits and take into account the possibility of using longitudinal or experimental research methods in the future to gain a more complete understanding.

Future research could investigate the effects of additional variables like trust, perceived value, switching costs, and customer involvement in addition to the moderating effect of customer satisfaction, which was the focus of this study. A more thorough grasp of the relationship between brand equity and these additional moderating factors might result from looking into them.

Comparative research across several telecom firms or geographical areas can shed light on the differences in brand equity, customer cheerfulness, and customer loyalty.

It is possible to gain a deeper understanding of the underlying mechanisms and customer perceptions influencing the relationship between brand equity, customer satisfaction, and customer loyalty in the telecom industry by combining quantitative research methods with qualitative research techniques, such as in-depth interviews or focus groups.

Abbreviations

AMOS**:** Analysis of Moment Structures
CEO**:** Chief Executive Officer
MLE**:** Maximum Likelihood Estimation
SEM**:** Structural Equation Model

Author Contributions

Endalkachew Desta: Conceptualization, Data curation, Software, Formal Analysis, Investigation, Writing - original draft, Methodology, Visualization, Writing - review & editing

Chalchissa Amantie: Conceptualization, Software, Supervision, Validation, Investigation, Writing - review & editing

Conflicts of Interest

The authors declare no conflicts of interest.

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