Measuring Commuters' Satisfaction: The Case of Railway Passengers in Bangladesh

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ABSTRACT

This study examined the relationship between railway service quality attributes and customer satisfaction based on passenger perception and expectation. The study employed a survey research design to collect data from the participants to investigate the relationship among service quality attributes and commuter satisfaction. All hypotheses were tested using correlation and regression analysis. To explore the extent of gap between customer expectation and their perceived value, we compared each value difference between all 22-item expectations and perceptions to arrive at a conclusion for the level of quality. The results of this study indicated that service quality was an important antecedent of customer satisfaction. All tested hypotheses were found to be statistically significant and all service quality dimensions were either strongly or moderately correlated with commuter satisfaction. In all of the service quality dimensions the expectations of the commuters exceeded their perceptions.

Keywords: Customer Satisfaction, Perception, Expectation, Service Quality, Public Transport, Non-Motorized Vehicles

บทคัดย่อ

งานวิจัยฉบับนี้ศึกษาความสัมพันธ์ระหว่างลักษณะคุณภาพของการบริการรถไฟกับความพึงพอใจของลูกค้าจากการรับรู้และความคาดหวังของผู้โดยสาร งานชิ้นนี้ใช้การวิจัยเชิงสำรวจในการรวบรวมข้อมูลของผู้เข้าร่วม ในการศึกษาความสัมพันธ์ระหว่างลักษณะคุณภาพของการบริการและความพึงพอใจของผู้ไปกลับเป็นประจำ ทุกสมมติฐานได้รับการตรวจสอบด้วยการวิเคราะห์สหสัมพันธ์และการวิเคราะห์การถดถอย เพื่อสำรวจขนาดของความแตกต่างระหว่างความคาดหวังของลูกค้าและคุณค่าที่ลูกค้ารับรู้ได้ เราเปรียบเทียบค่าความแตกต่างจำนวน 22 รายการ เพื่อสรุปผลระดับคุณภาพ ผลลัพธ์ของการศึกษานี้ชี้ให้เห็นว่าคุณภาพของการบริการเป็นต้นเหตุสำคัญของความพึงพอใจของลูกค้า ทุกสมมติฐานที่ถูกทดสอบมีนัยสำคัญทางสถิติ และคุณภาพของการบริการในทุกมิติมีสหสัมพันธ์กับความพึงพอใจของผู้ไปกลับเป็นประจำ อย่างพอควรหรืออย่างมาก ในทุกมิติของคุณภาพของการบริการผู้ไปกลับเป็นประจำมีความคาดหวังเกินกว่าการรับรู้

คำสำคัญ: ความพึงพอใจของลูกค้า, การรับรู้, ความคาดหวัง, คุณภาพของการบริการ, การขนส่งสาธารณะ, ยานพาหนะที่ไม่ใช่ยานยนต์

INTRODUCTION

The world has been witnessing rapid private motorization because of the increased travel demand, resulting in an increased traffic congestion that leads to longer travel time for many people (Ellaway, Macintyre, Hiscocl, & Kearns, 2003; Asri & Hidayat, 2005), an increased consumption of various non-renewable resources (Abman & Sieber, 2005) and a serious threat to the quality of human environments (Goodwin, 1996) in

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both developed and developing countries (Najneen, Hoque, Mahmoud, Rahman, & Sharmin, 2010). Traffic congestion is a common occurrence almost in all the cities in Bangladesh. A large number of non-motorized vehicles (scooters, bikes, rickshaws, human haulers) and motorized vehicles (vans, push carts, microbuses, cars, jeeps, trucks) occupy the road, reducing road capacity and creating congestion, thus making the roads unsafe for not only the pedestrians but the motorists as well. In addition, increases in urban population are creating pressure on the existing transportation system. This expansion of population is making city dwellers life standstill on the roads of major cities during the rush hours of morning and evening (Shamser & Abdullah, 2013). In order to prevent problems caused by the increase in traffic congestion from increased motorization, researchers and public decision makers have become more and more prone to public transport that provides continuing general or special transportation to the public excluding school buses, charter and sightseeing services. Public transportation includes various modes such as buses, subway, rail, trolleys and ferry boats.

Many public sector organizations including transportation services are created by governments with an intention not to compete in the open market. Instead, their objective is to fulfill the needs of the common public. In order to keep and attract more passengers and fulfill their needs, public transport must have high service quality to satisfy and meet a wider range of customers' needs (Oliver, 1981; Anable, 2005). It is, therefore, important to identify what drives customer satisfaction and dissatisfaction in public transport so as to design an attractive and marketable public transport system. The focus of this paper is to assess service quality and the satisfaction of railway passengers in Bangladesh. The rail transport has been an alternative and viable transport mode for travelers in urban areas, especially those who commute to and from their homes, at least 50 to 60 miles away from cities. Bangladesh is no exception to this norm.

Railway is a popular public transport mode in Bangladesh. Commonly known as BR (Bangladesh Railway), it is run and operated by the Government of Bangladesh. Bangladesh inherited its railway network from undivided India. Railway is a popular mode of transportation in Bangladesh since travelling by train is cheaper than any other mode of transportation. Currently, railways play a vital role in fostering greater connectivity across and within regions of the country. The main strength of rail transport vis-a-vis road transport lies in long distance travel and carriage of goods.

Bangladesh Railways, primarily a passenger railway system, carries its maximum number of passengers between Chittagong and Dhaka, the nation's most important transport corridor. While the road network has increased significantly, no matching expansion of the rail network has been made. The necessity of connecting the Port of Chittagong to the tea gardens of Assam of India led to the construction of railways in Chittagong and the first railway line connecting the Port to Assam was opened in 1895. Thereafter other lines were laid connecting the city and the district to the rest of Bangladesh. Chittagong Railway Station is situated near the Bipani Bitan, also known as the New Market, and Reazuddin Bazar. Besides the inter-district trains, there are local trains connecting the city with rural areas like Dohazari, Nazirhat and Chittagong University (see railway.gov.bd).

Due to lack of an adequate budget for maintenance of rail tracks and other infrastructures, the rail sector is in a deplorable condition, resulting in poor performance of BR (Abdullah, 2012). As public transport organizations grow older and become matured, the quality of service dwindles down and the public is left with no

option but to accept what is offered (Andreassen, 1994). Therefore, such a situation warrants that the concept of quality needs to be introduced or reintroduced back into public transportation so as to meet the quality expectations of the public (Ancarani & Capaldo, 2001). Moreover, quality remains a great and grave concern to the commuters of public transport. Because of all these reasons, we carried out this study. Moreover, despite that service quality constitutes an important aspect in public transportation, there is limited research being done to explore this issue, especially in government run rail service in Bangladesh.

The purpose of this study is to examine the relationship between customer satisfaction and service quality in the rail service sector of Bangladesh with respect to various service quality dimensions. A study like this is essential to assess and improve service delivery and design, because it will provide management with empirical data that they can use in making inferences about the customers. (Wilson, Zeithaml, Bitner, & Gremler, 2008). This study, therefore, investigates the service quality commonly referred to as SERVEQUAL attributes by academia and researchers in the business world that affect satisfaction of the commuters who travel by rail in Bangladesh that run between the city of Chittagong and several rural areas (Nazirhat and Chittagong University) in the district of Chittagong. We explore this issue from the passengers' perspective through assessing their expectations and perceptions of service quality of Bangladesh Railway.

The study is justified for a number of reasons. First and foremost, since the independence of Bangladesh, there have been nominal allocations of funds for the expansion and reconstruction of rail transports in the country (Abdullah, 2012). Service quality has remained a great concern to public transport, particularly in the railway sector. The negligence over decades has left the railway sector with a very poor capacity to serve the people. The relationship between service quality and satisfaction is complex due to the intricate interplay between performance dimensions used in quality judgments and those used in satisfaction judgments. Not enough studies in the context of Bangladesh exist on the topic, so the present study, constituting a field study, will contribute to a better understanding of SERVEQUAL factors that affect the customers' perceived satisfaction of rail transport in Bangladesh. Thus, this study constitutes an aid to the policy makers, researchers and the government for improving the various quality aspects of rail transport in Bangladesh.

FRAMEWORK AND RESEARCH HYPOTHESES

In this paper we explore the relationship between railway service quality attributes and customer satisfaction based on passenger perception and expectation. Following Zeithaml, Parasuraman, & Berry (1990), we classify and focus on five factors of SERVEQUAL that could predict the quality of the service provided by Bangladesh Railway for its customer satisfaction. We also examine the significant differences in these five service quality dimensions by evaluating customers' satisfaction of rail transport in Bangladesh. The five service quality attributes and their operational definitions are depicted in Table 1.

We posit the following framework as illustrated in Figure 1.

1. Overall service quality (OSQ) is a function of service quality dimensions
2. Customer satisfaction (CS) is a function of service quality dimensions and overall service quality (OSQ)

The main variable, from customers' perspectives, are customer satisfaction and service quality. Customer satisfaction is a dependent variable and service quality and its dimensions are independent variables.

TABLE 1

Dimensions of SERVEQUAL Attributes and Their Operational Definitions

Tangibility	Appearance of physical facilities, equipment, personnel and written materials
Reliability	Ability to perform the promised service dependably and accurately
Responsiveness	Willingness to help customers and provide prompt service
Assurance	Employees' knowledge, courtesy and their ability to inspire trust and confidence
Empathy	Caring, easy access, understanding customers and individualized attention to customers

Note: Adapted from Zeithaml et al. (1990).

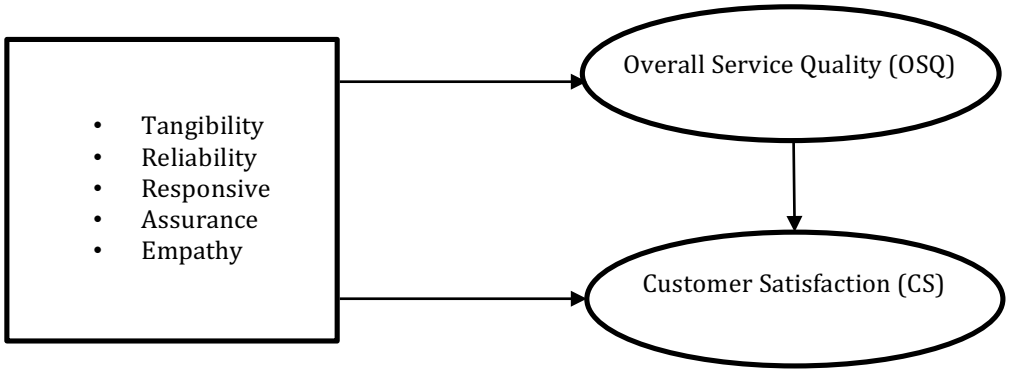

FIGURE 1

Framework

The research questions we seek to answer in this article are

- How do commuters expect and perceive service quality of Bangladesh Railway on a service quality scale popularly coined as the SERVQUAL scale given by Parasuraman, Zeithaml, & Berry (1988)?
- Are consumers satisfied with overall service quality offered by Bangladesh Railway?

Based on the above research framework and questions, we propose the following hypotheses.

H1: Service quality dimensions (Tangibility, Reliability, Responsiveness, Assurance, and Empathy) have a significant relationship with overall service quality (OSQ).

H2: All five service quality dimensions noted in H1 have a significant relationship with customer satisfaction (CS).

H3: Overall service quality (OSQ) has a significant relationship with customer satisfaction (CS).

LITERATURE REVIEW

Following the research on service quality popularly known as SERVEQUAL by Parasuraman, Zeithaml, & Berry (1985), there has been much research on the topic and its relationship to customer satisfaction (see Godwin, 1996; Brady & Cronin, 2001; Zhu, Ramanathan, & Ramanathan, 2011; Bag & Sen, 2012). In all of these studies service quality has been defined as the difference between customer expectations and perceptions of services delivered by the firms. The SERVQUAL is a well-regarded model and a common diagnostic tool used to measure customer expectation and their perceived satisfaction.

SERVQUAL was developed in the mid 80's by Parasuraman et al. (1985) with a 22-item scale to measure service quality generally across various service industries such as banking, credit card companies, motor repair shops, etc. SERVQUAL originally measured on ten aspects of service quality, namely, reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding the customer and tangibles. By the early 1990s the authors have refined the model to five aspects of service quality: tangibility, reliability, responsiveness, assurance and empathy. Sureshchandar, Rajendran, & Anantharaman (2002) identified five factors of service quality, which were service product, human element of service delivery, systematization of service delivery, tangibility, and social responsibility. Miller (2011) examined a potential issue in measuring service quality using the SERVQUAL instruments and presented the results of a field study in which randomized and non-randomized versions of SERVQUAL were administered in multiple organizations and resulting samples were then used to generate factor structures which proved to be non-congruent.

Quality is the overall experience which a customer perceives through interacting with a product and service. Service quality is a competitive weapon (Parasuraman et al., 1988) for public transport to compete with rivals in private transport. The issue of improving service quality whereby an organization can derive competitive advantage has also been investigated by many researchers (Reicheld & Sasser, 1990; Hensel, 1990; Berry, Parasuraman, & Zeithaml, 1994; Berry & Parasuraman, 1997; Glynn & Brannick, 1998; Johnston & Heineke, 1998; Harvey, 1998). In all of these studies service quality has been used as an ingredient in understanding consumer behavior. A positive consumer behavior on service quality will lead to higher returns (Zahorik & Rust, 1992; Boulding, Kalra, Staelin, & Zeithaml, 1993; Liu, Sudharshan, & Hammer, 2000). Brown, Churchill, & Peter (1992) has referred to organizations bearing high service quality as preferable which facilitates them to charge premium prices.

Since an increased private motorization has resulted in increased traffic congestion, public transport, especially rail transport should become part of a solution for

sustainable transport in the future in highly densely populated countries like Bangladesh. However, in order to keep and attract more passengers, public transport needs to have high service quality to satisfy and fulfill a wider range of different customers' needs (Oliver, 1980; Anable, 2005). Therefore, it is imperative that BR provides service quality to its customers to remain a viable mode of sustainable public transport as a remedy to the increased traffic congestion.

Customer satisfaction (CS) is a key performance indicator of the activity of a firm or a corporation that is widely recognized. Previous studies (e.g., Eboli & Mazula, 2007; Friman, Edvardsson, & Garling, 2001; Randheer, AL-Motawa, & Prince, 2011; Sharma & Yadav, 2013) show that public transport is still an alternative travel mode for many people. In order to retain current passengers, public transport has to improve the service to accommodate a wide range of customers' needs and expectations (Andreassen, 1995; Beirão & Cabral, 2007). Customer satisfaction is a personal feeling of either pleasure or disappointment resulting from the evaluation of services provided by an organization to an individual in relation to expectations. Service providers frequently place a higher priority on customer satisfaction, because it has been seen as a prerequisite to customer retention. Service quality and customer satisfaction have been proven from past studies to be positively related (Kuo, 2003; Gera, 2011). Therefore, service quality should be treated as an antecedent of customer satisfaction. Customers routinely make a comparison of their expectations (what they feel service providers should offer) with their perceptions of the performance of the service provider (Gronroos, 1982; Parasuraman et al., 1985).

In the satisfaction literature, expectations are considered as 'predictions' by customers about what is likely to happen during a particular transaction, while in the service quality literature, expectations are viewed as desires or wants of consumers, that is, what they feel a service provider 'should' offer rather than 'would' offer. For our study, we will define expectations as desires or wants of customers because this allows us to know exactly what service providers offer and this is based on past experience and information received (Douglas & Connor, 2003). It is important to understand and measure customers' expectations in order to identify any gaps in delivering services with quality that could ensure satisfaction (Negi, 2009). Perceptions of customers are based solely on what they receive from the service they encounter (Douglas & Connor, 2003).

The foregoing literature review reveals that there is a correlation between SERVEQUAL attributes and customers' satisfaction. The current research is focused on examining the commuters' expectations and perceptions of service quality of rail transport of Bangladesh. The train service quality is defined as "the overall excellence of services provided by Bangladesh Railways that fare against commuters' expectation. Our study is mainly based on this discrepancy of expected service and perceived service from the customer's perspective. This is aimed at obtaining a better knowledge of how customers perceive service quality in rail transport of Bangladesh.

METHODOLOGY AND DATA

This research involves the use of a customer perception tool known as SERVQUAL. The study employed a survey research design to collect data from the participants to investigate the relationship among SERVEQUAL attributes and commuters' satisfaction and among the SERVEQUAL attributes and overall service quality (OSQ). The research is quantitative in nature. Quantitative data allows the researchers to present data in

descriptive form and to also determine in possible relationships between two or more variables. Quantitative research involving correlation describes the degree to which two or more variables are related (Frankly & Wallen, 2003).

A survey questionnaire based on SERVEQUAL was used to capture the information relating to the research objectives. The resulting questionnaire was divided into four sections. The first section relates to the demographic profile of the respondents. The second section measures customers' expectation. The third section measures customers' perceptions. Both the second and third sections involve SERVEQUAL items, as depicted in Table 1. The fourth section measures customers' satisfaction.

To administer the questionnaire two of the researchers located themselves at the university rail station. These researchers approached any person whom they judged available and proposed to him or her to fill a questionnaire. The researchers explained to all of the respondents that they were seeking to measure the gap between what they expected from Bangladesh Railway in terms of service quality and what they perceived in terms of service quality offered by Bangladesh Railway. The researchers did this because it was important to keep the respondents focused that they do not go astray since some could possibly ignore reading the instructions and it could render the work null and void.

Measurement of Variables

We have used the SERVEQUAL model as methodology for measuring customer satisfaction (CS) and overall service quality (OSQ). The SERVQUAL framework developed by Parasuraman et al. (1985) with 22 item scales is a well-regarded model and a common diagnostic tool used to measure customer service and perceived satisfaction. We have asked the respondents to rate their satisfaction to the item of overall satisfaction and 22 items in specific quality attributes for rail transport.

These five SERVQUAL dimensions are used to measure the gap between customers' expectation for excellence and their perception of actual service delivered. For each dimension of service quality, SERVQUAL measures both the expectation and perception of the service on a scale of 1 to 7, 22 questions in total. Each of the five dimensions is then weighted according to customer importance, where the score of each dimension is multiplied by its weight. Following this, the "gap" score for each dimension is calculated by subtracting the "expectation" score from the "perception" score. A negative gap score indicates that the actual service (the perceived score) was less than what was expected (the expectation score). The gap score is a reliable indication of each of the five dimensions of service together as functions of a customer's perceptions and expectations. In most cases, when expectation and perception are equal, service quality is satisfactory. Using SERVQUAL, service providers can obtain an indication of the level of quality of their service provision and highlight areas requiring improvement.

The respondents were asked to rate the "overall service quality" of Bangladesh Railway, using a 7-point semantic differential scale. Scores range from "very low" (1) to "very high" (7) to confirm all five dimensions of SERVEQUAL in determining OSQ (overall service quality) and CS (customer satisfaction).

The usual measures of customer service (CS) involve a survey with a set of questions. In this study we have measured customer satisfaction by a single direct question as "Overall how satisfied are you with the rail service to the commuters in this route"? This is in consonant with several studies (e.g., Westbrook, 1980; Oliver, 1980; Montinaro & Chirico, 2006). They all indicated that single item rating scales were common among researchers in testing customer satisfaction.

The Sample

The focus of this research is exploratory. The survey took the form of non-probability procedure (convenience one) since we do not know how many people commute by train in the rail route under study and we chose those students who had enough commuting experience (daily and weekly commuters) by train. Convenience sampling is considered as easy, fastest and most efficient way to collect the information that was needed. This is in line with several studies (e.g., Sekaran, 1992; Cooperand & Schindler, 2003). A convenience sample is simply one where the units are selected for inclusion in the sample. In our example, if we are interested in achieving a sample size of say 524 students and non-students in our study. We may simply stand at one of the main entrances to campus. Accordingly, we two, among the three, researchers did do this at Chittagong University railway station (the main station at the university main entrance) since our choice of respondents was students from the University of Chittagong and non-student commuters who get on and get off from the train at that station as well. The research timing scope was made within six months (from June 11 to November 11, 2013). Among a total of 524 questionnaires 451 questionnaires were valid. The valid rate of response of questionnaire is 86 percent, a fairly good response rate for the study.

The percentage of male respondents was 54 and female 46 percent. 70 percent of the respondents were university students and 30 percent were daily passengers to and from offices located at various places in Chittagong district within the distance from 30 to 40 miles from the city of Chittagong. Most respondents were in the age bracket of 25 to 30. This is easily understandable since 70 percent commuters are students commuting by train daily from and to the university, which is only 20 to 25 miles away from the city. Among the non-students, 60 percent had a bachelor's degree, 30 percent had a master's degree and others had some college education. Among students 65 percent were undergraduate students and 35 percent were graduate students.

Reliability Analysis

Cronbach's alpha reliability analysis was conducted on the independent variables in order to determine the reliability of the instrument used. As seen in Table 2 each variable consisted of at least 4 variables. The values of Cronbach's alpha are greater than 0.60 and hence considered acceptable (Nunally, 1978). We, therefore, conclude that research instruments used in this study are valid and reliable.

TABLE 2

Reliability Analysis

Quality Dimensions	Cronbach's Alpha Expectations	Cronbach's Alpha Perceptions
Tangibility	0.83	0.90
Reliability	0.81	0.88
Responsiveness	0.78	0.86
Assurance	0.83	0.79
Empathy	0.87	0.92
Overall Service Quality	0.79	0.82

Data Analysis

The data collected were analyzed using the five SERVQUAL dimensions to measure the gap between customers' expectation for excellence and their perception of actual service delivered followed by the correlation and regression analyses in order to establish the relationship between SERVEQUAL attributes and customer satisfaction. Following Stanovich (2007), all hypotheses were tested by the coefficient of correlation measures. Hypothesis testing was done to analyze direct effects of independent variables on customer satisfaction, controlling for demographic variables. The regression models consist of a function describing how the dependent variable is related to one or other explanatory variables, i.e. how changes in one or more variables will change the value of another. Particularly, the models were employed to look at the effects of SERVEQUAL dimensions—tangibility, reliability, responsiveness, assurance and empathy—on commuters' satisfaction and overall service quality as follows.

$$\mathrm{OSQ}_i = \beta_0 + \beta_1 TAN_i + \beta_2 REL_i + \beta_3 RESPON_i + \beta_4 ASSU_i + \beta_5 EMP_i + \varepsilon_i \quad (1)$$

$$\mathrm{CS}_i = \beta_0 + \beta_1 TAN_i + \beta_2 REL_i + \beta_3 RESPON_i + \beta_4 ASSU_i + \beta_5 EMP_i + \varepsilon_i \quad (2)$$

$$\mathrm{CS}_i = \beta_0 + \beta_1 OSQ_i + \varepsilon_i \quad (3)$$

where TAN is tangibility, REL is reliability, $RESPON$ is responsiveness, $ASSU$ is assurance, and EMP is empathy of customer i. That is, Equation (1) corresponds to H1, Equation (2) to H2, and Equation (3) to H3.

RESULTS

Gap Analysis

The customers' perception score (CP), customers' expectation score (CE), gap score (CP-CE) and the mean unweighted score of each SERVEQUAL dimension is shown in Table 3. To obtain the weighted scores, customers were requested to assign weights by distributing 100 points to all 5 dimensions according to their relative importance, as shown in Table 4.

From Table 3, all questionnaire responses were negative. The overall weighted SERVEQUAL score of -42.31 (Table 4) indicates a very significant shortfall in all dimensions of SERVEQUAL. This is the real cause for concern and provides a definite starting point for service improvements. This result is in consonant with a recent study:

> "The problems of the Bangladesh Railway include lack of capacity building, lack of proper servicing facilities and delay in finalization of tenders. The performance of BR is unsatisfactory because of a number of reasons. The development projects are not implemented as per schedule due to lack of skilled and efficient personnel. It may be mentioned that BR could not recruit officials since long, resulting in shortage of manpower which affects the regular operations of the train." (Abdullah, 2015)

TABLE 3

Customers' Perception Expectation Gap Score (Unweighted)

Dimensions	Statements	CP Mean Score	CE Mean Score	Difference between CP and CE
Tangibility	Professional appearance of staff	4.47	5.47	-1.00
	Physical comfort level of customers	4.41	5.26	-0.85
	Accessible and visual display of materials	3.23	5.38	-2.19
	Modern looking equipment	2.29	4.62	-233
	Average	**3.6**	**5.18**	**-1.58**
Reliability	Rails are accurate in record keeping	4.23	6.59	-2..36
	Rails are accurate in train timings	5.48	6.38	-0.90
	Adhere to punctuality of trains	4.89	6.78	--089
	Staff shows interest in solving problems	3.26	5.19	-1.93
	Perform service correctly	2.68	5.86	-3.18
	Average	**4.10**	**6.16**	**-2.06**
Responsiveness	Staff is always willing to help customers	3.24	6.26	-3.02
	Never too busy to respond	4.29	5.80	-1.51
	Staff tells exactly when services will be performed	3.89	5.69	-1.80
	Treat public situation with care and seriousness	2.46	5.86	-3.40
	Average	**3.47**	**5.90**	**-2.43**
Assurance	Staff is trustworthy	4.23	5.89	-1.59
	Staff is courteous	3.83	6.20	-2.37
	Staff is knowledgeable	4.65	5.48	-0.83
	Commuters feel safe in travel	3.44	5.88	-2.44
	Average	**4.03**	**5..86**	**-1.83**
Empathy	Railways give individual attention	2.98	6.12	-3.14
	Understand commuters' specific needs	2.38	6.33	-3.95
	Customers' best interest at heart	2.85	5.88	-3.03
	Staff renders personal service to customers	2.67	5.24	-2.57
	Railway operations are convenient to all passengers	4.66	5.34	-0.68
	Average	**3.10**	**5.78**	**-2.68**
Average SERVEQUAL gap score (unweighted)				**-2.11**

Note: CP is the abbreviation for customers' perception, and CE for customers' expectations.

TABLE 4

SERVEQUAL Weighted Scores

SERVEQUAL Dimensions	Unweighted Mean score	Importance Weight (Total = 100)	Unweighted Score X Importance Weight	Weighted Score
Tangible	-1.58	20.2	-1.58 X 20.2	-31.91
Reliable	-2.06	20.6	-2.06 X 20.6	-42.43
Responsiveness	-2.43	19.7	-2.43 X 19.7	-47.87
Assurance	-1.83	19.4	-1.83 X 19.4	-35.50
Empathy	-2.68	20.1	-2.68 X 20.1	-53.86
Average Weighted SERVEQUAL Score				**-42.31**

Correlation Matrix

After having examined the Gap scores, we decided to construct a correlation matrix to see if there are significant correlation among all the dependent and independent variables. Table 5 reports the correlation matrix. All SERVEQUAL dimensions are positively and significantly correlated with CS and OSQ. "Empathy" had the strongest impact on the dependent variable—customer satisfaction (.764**), followed by responsiveness (.655**). Strong correlation is also evidenced between OSQ and CS (.899**). The table also suggests that there are inter-correlations among all the dependent and independent variables.

TABLE 5

Inter-Correlation among Dependent and Independent Variables

	CS	OSQ	TAN	REL	RES	ASSU	EMP
CS	1	.899**	.456**	.436**	.655*	.566**	.764
OSQ		1	.795**	.767**	.451**	.430**	.788**
TAN			1	.844**	.361**	.522**	.636**
REL				1	.424**	.597**	.647**
RES					1	.403**	.486**
ASSU						1	.424**
EMP							1

Note: The correlation is significant at .01 level (1 tailed). CS is the abbreviation for customer satisfaction, OSQ for overall service quality, TAN for tangibility, REL for reliability, RES for responsiveness, ASSU for assurance, and EMP for empathy.

Test for Multicollinearity

Table 6 indicates that tolerance values of all SERVEQUAL dimensions are above 0.10. Likewise, all of the variance inflation factor (VIF) values are less than 10, thus confirming that multicollinearity is not a concern (Burns & Busch, 2007).

TABLE 6

Multicollinearity Statistics

Independent Variables	Tolerance	VIF
Tangibility	.986	1.16
Reliability	.668	1.67
Responsiveness	.469	2.38
Assurance	.779	1.62
Empathy	.754	1.36

Regression Analysis

We begin our regression analysis by evaluating H1. To do so, we estimate Equation (1). The results are reported in Table 7. All SERVEQUAL dimensions have influenced OSQ, as evidenced by large coefficient estimates and *T*-statistics. The *F*-value is 21.6, and the *p*-value is 0.000 which is significant at 5% level (H1 accepted). From the adjusted R-squared value, 28.9 percent of the changes in the dependent variable OSQ are explained by the independent variables.

TABLE 7

Regression of OSQ on SERVEQUAL Dimensions

Independent Variables		β	*T*-test	*p*-value
Constant		1.970	13.2	0.000
Tangibility		0.397	3.27	0.000
Reliability		0.228	2.34	0.000
Responsiveness		0.302	2.02	0.000
Assurance		0.489	2.59	0.000
Empathy		0.502	2.39	0.000
Adjusted R squared	28.9			
F-value	21.6			
Significance	0.000			

Similarly, we evaluate H2 by estimating Equation (2). The results are reported in Table 8. All SERVEQUAL dimensions have influenced customer satisfaction, as evidenced by large coefficient estimates and *T*-statistics. The *F*-value is 18.6 and the *P*-value is 0.000 which is significant at 5% level (H2 accepted). The adjusted R squared indicates 26.8% of the changes in the dependent variable CS (customer satisfaction) are explained by the predictor variables.

Finally, we evaluate H3 by estimating Equation (3). Table 9 indicates OSQ has a strong impact on customer satisfaction, as evidenced by large coefficient estimates and *T*-statistics, supporting H3. The adjusted R-squared implies that 32.4 percent of the changes in the dependent variable are explained by the predictor variable OSQ.

TABLE 8

Regression of CS on SERVEQUAL Dimensions

Independent Variables		β	*T*-test	*p*-value
Constant		2.391	12.6	0.000
Tangibility		0.205	3.97	0.000
Reliability		0.216	4.45	0.000
Responsiveness		0.195	2.53	0.000
Assurance		0.267	6.53.	0.000
Empathy		0.289	7.63	0.000
Adjusted R squared	26.8			
F-value	18.6			
Significance	0.000			

TABLE 9

Regression of CS on OSQ

Independent Variables		β	*T*-test	*p*-value
Constant		0.879	8.66	0.000
OSQ		0.989	16.23	0.000
Adjusted R squared	32.4			
F-value	22.3			
Significance	0.000			

CONTRIBUTIONS AND IMPLICATIONS

The commuters demand that, because of the nature of railway services, they should be given services to their expectations and perceptions. It is, therefore, essential for Bangladesh Railway to explore the causes of dissatisfaction, pay very close attention to their needs and expectations (current and future) and do whatever is necessary to mitigate the gap between their perceptions and expectations.

The main objective of this study was thus to investigate the effects of SERVEQUAL dimensions on customer satisfaction. The results indicated that service quality is an important antecedent of customer satisfaction and this result is consistent with several studies (Buttle, 1996; Lee, Lee, & Yoo, 2000; Zeithaml & Bitner, 2003; Andaleeb & Conway, 2006). Further, this research found that commuters experienced a difference between expectation and perception on the service received. Hence, the findings reinforce the need for continuous improvement of the service quality.

The results from this study suggest that to improve customer satisfaction on public transport like rail service, public transport decision makers and providers should improve service quality in in all dimensions of SERVEQUAL. Furthermore, the study implies that service that meets the expectations of the commuters can attract a large number of people to reduce the use of privately owned transport like cars, scooters,

bikes, human haulers or other vehicles, thus solving an increased traffic congestion in the country. This study also shows that knowing about customers' perceptions on service quality, trying to meet and manage customers' expectations, improving quality management by identifying areas that have weaknesses in terms of meeting customers' needs are important factors in providing services.

LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

Nevertheless, there are two limitations to this study. First, most respondents were university students commuting daily to and from the university. The students usually have higher expectations and always demand higher services from the organization like BR. Therefore, it is likely that their responses were skewed and did not reflect the true picture about the perceived value of SERVEQUAL dimensions. As a result, it is important to recruit more non-students than students who commute daily to and from work in this route to get a better picture about the expectations and perceived quality of service. The other limitation is that the study was conducted in one route running from Chittagong City to Nazirhat with a stop at Chittagong University area, called University Station. The results, therefore, could not generalize the voice of Bangladesh Railway commuters. Future studies should recruit a higher number of respondents in a greater number of rail routes.

Finally, when service quality is analyzed at an attribute level, it is revealed that on board security is important. One way to increase on board security is to add more security personnel and to install surveillance in the compartments and waiting areas. Past research (e.g., Le-Klahn, 2013) suggests other factors that also influence customer satisfaction judgment. In future research, it is important to investigate such other factors and to conduct in-depth interviews involving a higher number of respondents, thus creating a more relevant customer satisfaction measurement. One can also explore the difference between student commuters and non-student commuters in measuring service quality and customer satisfaction in public transport like Bangladesh Railways.

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