Ferry Passengers' Satisfaction: an Empirical Assessment of Influence of Ferry Route Type

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Abstract

The study presents a ferry transport passenger's satisfaction from ferries using Lake Victoria in Tanzania. The objective is to provide a better understanding on whether or not route type (long route or short route) can explain the passengers' satisfaction perceptions on service quality dimensions (convenience satisfaction, customer care satisfaction, technology satisfaction, reliability satisfaction and safety satisfaction). Both primary and secondary data were collected. The questionnaire was the main instrument in primary data collection. Convenient sampling technique was used. Data analysis was performed using independent mean test comparisons and regression analysis.

Results under independent mean test comparison showed that there is a statistical significant difference between long route and short route in four satisfaction dimensions, namely, convenience, customer care, technology and reliability. Regression estimates also proved that there is a significant satisfaction decrease between the short route and convenience, customer care, and technology, while they showed that there is a significant passengers' satisfaction increase in service

reliability. The study provides significant implications to operators of ferry companies by providing means to improve passengers' satisfaction. Among other things; they need to consider whether they operate in the short route or the long route. Also for policy makers, the study suggests that they should consider route type in policy formulation and policy implementation nd directives for ferry services

Keywords: ferry transport, public transport and customer satisfaction

Introduction

In transport service, passenger satisfaction is an issue that has drawn attention of practitioners, policy makers and academicians. Several studies in public transport have addressed passengers' satisfaction in different dimensions. They include service reliability (Bergantino and Bolis, 2008) and safety (Lu and Tseng, 2012). Existing transport literature suggests that the state of satisfaction will vary from person to person, product to product or service to service and it also depends several factors like psychological, economic or physical factors (Kumbhar, 2011). According to Barid (2012), in order to satisfy customers, firms in the service industries must have enough knowledge about customers' expectations, especially in a situation where production and consumption of services are run simultaneously.

Passengers' satisfaction is regarded to be one of critical issues in the transport service sector (Kai and Jen, 2006). Passengers' preference for one mode of transport or another can be highly influenced by service satisfaction. For example, Mramba (2012) noted that passengers in Lake Victoria ferries tend to switch from ferry transport to other alternatives such as bus for long distance journeys and boats for short distance journeys mainly, due to unsatisfactory ferry services.

Demand for ferry transport services in Lake Victoria used to be very high in ten years ago due to poor road infrastructure connecting three

regions (Mramba, 2012). As time goes, a large number of ferry users switches to buses or small boats due to unsatisfactory ferry services. Unsatisfactory services may be due to lack of enough vessels, poor vessel conditions, poor customer care, mixing of passengers and cargo as well as insufficient safety equipment (Mramba, 2012). Moreover, there has been an observation that as time goes, ferry transport in Lake Victoria is becoming user unfriendly due to frequent increases in ferry fares endorsed by Surface and Marine Transport Regulatory Authority [(SUMATRA) (Sezzy, 2011]. However, the observed price increase does not match the level of provided services (Hamalos, 2013). This suggests that passengers' satisfaction is still a major concern.

Ferry service providers in Tanzania include both government owned ferries and privately owned ferries. Although there is no any subsidy offered to privately owned ferries, they still provide relatively better services than government owned ferries. Most government owned ferries are old aged vessels (MoT, 2011). Due to geographical location and available infrastructures, some areas are only accessible by using ferry services. Although road and air transport could be used as substitutes, majority of passengers cannot afford them. Therefore, the ferry sector is of paramount importance as a part of the general transport sector in Tanzania.

Ferry transport sector in Lake Victoria is faced with a number of challenges. Apart from lack of enough infrastructure/facilities, there are frequent ferry accidents, most of which are said to be caused by overloading and using unauthorized vessels (local boats) to carry passengers. Different reports show that there are frequent ferry accidents in Lake Victoria from 1996 to 2012 (Mramba, 2012)

According to SUMATRA-Lake Zone office, short route ferries between Mwanza and near points like Kamanga and Busisi carry more than 10,000 people and around 400 cars every day. If a ferry operates on regular schedules, it makes between 16 and 20 trips per day. The local (wooden)

boats have no proper scheduled route or estimated number of trips. Instead, they operate depending on availability of passengers, time taken and distance travelled.

In long route ferries, the trip frequency between Mwanza and Bukoba is normally three times per week. There is only one vessel (Mv. Victoria), which departs from Mwanza at 21:00 hours and arrives in Bukoba at 07:00 hours on the next day. On the same day, the same vessel departs from Bukoba at 21:00 hours and arrives in Mwanza at 07:00 hours on the next day. Ukerewe ferries' trip frequencies are more convenient than Bukoba ferries' trip. Every day, there are two ferries departing from Mwanza to Ukerewe and also two ferries depart from Ukerewe to Mwanza. The operation time of all Ukerewe ferries in both directions is between 09:00 hours to 18:00 hours (SUMATRA Lake Zone Office).
Nonetheless, literature review revealed that none of the existing studies has considered route type as a factor that can explain passengers' satisfaction on service quality. It is expected that short route and long route are different, based on factors such as number of transport service providers and operating costs, which, in turn, may affect service quality.

In due regard, this study aimed at filling in the noted gap in literature by investigating influence of route type (short route versus long route) on passengers' satisfaction. This general objective was achieved under the following specific objectives: to compare passenger's satisfaction dimensions based on travel route type and to examine the effect of travel route type on passenger's satisfaction.

Findings from this study will add knowledge to both practitioners in the ferry sector and academia on the important role of route type in measuring passengers' satisfaction. More so, the findings will provide insights to policy makers on reviewing and improving marine transport policies.

Literature Review

General Theories

The study used the theory of quality gaps and theory of expectation confirmation to provide the frame of reference.

Quality Gaps Model: Quality theory model is the model used to assess customer expectations and perceptions on service quality business. Perceived service quality gap can be defined as difference between consumers' expectations and perceptions and the service delivered (Parasuraman *et. al.*, 1985). The assumption made here is that the level of service quality perceived by customers is influenced by the gap between their expectation before using services and their perception on what they actually receive. There are five dimensions proposed by this model, which are used to evaluate service quality. They include the following: tangibility, reliability, responsiveness, assurance and empathy (Parasuraman *et. al.*, 1985). This theory suggests that if the service offered to the customer meets the mentioned five dimensions, the customer's perception on the service will be positive. Other scholars argue that service quality model should include functional quality, technical quality and corporate quality (Gronroos, 1984) . In this study, ferry service quality was measured in five dimensions of passenger satisfaction, which are convenience, customer care, technology, reliability and safety.

Expectations Confirmation Theory (ECT): The theory deals with four main constructs, which are expectations, performance, confirmation/ disconfirmation and satisfaction. This theory holds that service performance expectations have an impact on post-purchase satisfaction. The theory provides for two post-purchase outcomes: confirmation or disconfirmation between performance and expectation. If the service or product meets

customer's expectations, the customer is satisfied but if a service fails to meet customer's expectation, the customer is likely to be dissatisfied (Spreng *et. al*., 1996). Expectations reflect the anticipated performance behavior (Churchill and Surprenant, 1982). Disconfirmation (negative satisfaction) is divergence of an actual service experience from the customer's prior expectations. In relation to this study, the theory helps to explain that ferry passengers feel satisfied or dissatisfied with ferry services when they meet or do not meet their expectations. Passengers' judgment on service satisfaction was measured by rating their satisfaction dimension on given service quality dimensions.

Empirical Studies

Tanzania Merchant Shipping Act (2003) defines a passengers' vessel (ferry/ boat/cruise) as any vessel built and operated to carry more than 12 passengers and that is not a cargo-passengers vessel (MSA, 2003 pp.6). Time taken during the trip (shipment time) is also very important because vehicle rent is paid on time basis and also some products are perishable so they need quick delivery *(Johan et. al.,1997*). In this study, ferry transport is defined as an infrastructure that connects passage across water bodies like an ocean, a lake or a river.

White (2002) defined public transport as a type of transport that includes all modes available to the public, scheduled and non-scheduled, which are providing transport services, irrespective of ownership. Public transport can be defined as a viable substitute to private car use (Holmgren, 2007). In this study, ferry transport is termed as a public transport because it carries many passengers and trucks/cargo from one point to another point across a water body such as an ocean, a lake or a river.

Customer satisfaction has been defined as personal feelings of pleasure or disappointment by making a comparison between service perceived performance and its outcome in relation to customer expectation (Kotler,

2000). Also, literature suggests customer satisfaction can be viewed as a judgmental aspect borne out of comparison of pre-purchase expectation and post-purchase evaluation of product or services (Oliver, 1980). Customer satisfaction can also be regarded as re-organizational capability to attract and maintain customers as well as improve the customer relationship over a period of time (Anderson *et. al*., 1994). In this study, customer satisfaction is conceptualized as the ferry passenger's perception in terms of convenience, customer care services, level of technology used, reliability and safety to meet their expectations in transportation services. Geetika and Nandan (2010) conducted a study on railway platform in India. The study intended to identify features for passenger satisfaction on railway platforms. After grouping some factors together, the study came up with five factors that were considered to be the most important for determining passenger's satisfaction in railway platforms (*ibid*.). The suggested factors included the following: refreshments, behavior of the operating staff, information system and efficiency, basic facilities, and safety satisfaction (*ibid*.). This study employed a similar approach to assess the passengers' perception on five service quality dimensions, but the focus was on whether route type or not influences on passenger satisfaction.

Kai and Jen (2006) conducted a study on passengers' perceived service quality on city buses in Tai Pei in China. The aim of the study was to understand passengers' perception and expectation on quality of services provided (*ibid*.). They (*ibid*.) developed four service quality dimensions, namely, interaction with passengers, tangible services equipment, convenience of the service and operating management support. Kai and Jen (2006) recommended that using an assessment of four dimensions management can detect whether or not the services quality is acceptable by passengers. In due regard, the mentioned service quality dimensions were used by this study to understand passengers' satisfaction perception between two routes.

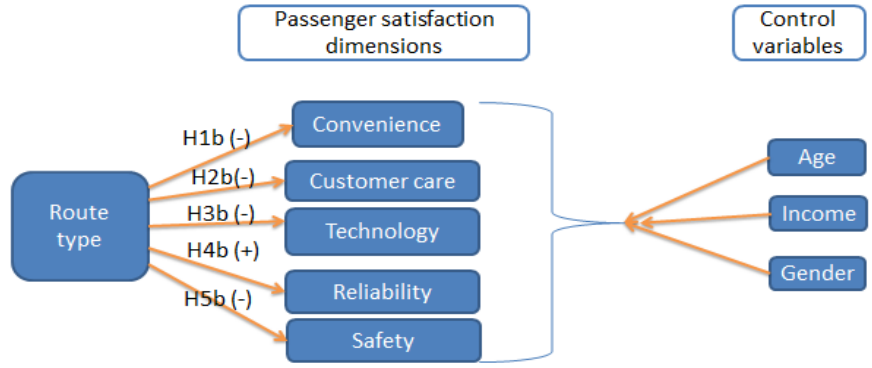
Kumar (2012) conducted a qualitative study with the purpose of ascertaining expectation and perception of passengers using public transport in India. A total number of 200 passengers were selected as a sample size (*ibid*.). The study used six dimensions, namely, assurance, empathy, reliability, responsiveness, tangible and comfort (*ibid*.). The study revealed that there is a big difference on passengers' perception on various service quality dimensions. Using a Chi-square test, they (*ibid*.) compared satisfaction on the basis of gender and occupation. The results showed that there is a difference between satisfaction gained by male and female travelers and likewise, between passengers of different occupations (*ibid*.). However, they did not show if perceived satisfaction can be different based on route type. Therefore, this study used independent mean test and regression analysis to compare satisfaction gained by passengers in short and long routes, in relation to their socio-economic background such as gender, income and age.

Most of the mentioned studies were conducted in Asian countries, whose contexts may be different from African countries like Tanzania. In addition, the studies addressed transport sectors other than ferry sector. However, these studies still provide useful insights on further assessment of public transport service satisfaction.

Research Model

The study developed a research model (Figure 1) composed of route type as the main predictor variable, on five dimensions of satisfaction, namely, convenience, customer care, technology, reliability and safety. In addition to route type, the model included the following three control variables: customer's age, income and gender.

Figure 1: *Research Model of Passenger Satisfaction*



Research Hypotheses

In order to test the presented research model, the following hypotheses were formulated:

Route type and convenience satisfaction: Convenience of service is considered as non-monetary values offered to customers (Colwell *et. al.*, 2006). In this study, convenience satisfaction means a situation whereby passengers are fitted and comfortable in using ferry services. With reference to ferry services in Lake Victoria, it is expected that long route ferries are more convenient to customers than short route ferries due to seat condition and shelter facilities found in respective vessels. Also long route ferries are more connected to other modes of transport such as railways, roads and near to airports than short route ferries. Based on the presented arguments, it is hypothesized that:

H_{1a}: There is a significant difference on convenience satisfaction between long routes and short routes.

H_{1b}.Convinience satisfaction decreases in short routes compared to long routes.

Route type and Customer care satisfaction: An essential approach to standard of services quality is customer care. It involves understanding customers and their expectations. (Clutterbuck, 1992). According to (Daniels, 1993), customer care and service quality management are two objects moving parallel. In this study, the term customer care is focused on how passengers enjoy ferry services and other associated services before and during the travel among two route types. Services such as food, drinks and time table awareness offered in the long route ferries are expected to be better than in the short route ferries. Hence, on that basis, the following hypotheses are formulated

H_{2a}: There is a significant difference on customer care satisfaction between long routes and short routes.

H_{2b}.Customer care satisfaction decreases in short routes compared to long routes.

Route type and technology satisfaction: Technology can be defined as a process of embodying innovative and advanced techniques with the aim of achieving positive economic ends (Njoh, 1999). Among aspects considered in transport model are travel speed and time to make a trip. The two items can be contributed by type of vessel and infrastructure used. In this study, the terms technology satisfaction aims at comparing how passengers in the two routes are satisfied with the level of vessels and infrastructure used, time to make a trip and smoothness of the ride among two routes. Most of the vessels and infrastructures used in long routes are somehow more advanced than short route ferries. Hence, from that point, it can be hypothesized that,

H_{3a}: There is a significant difference on technology satisfaction between long routes and short routes.

H_{3b}.Technology satisfaction decreases in short routes compared to long routes.

Route type and Reliability satisfaction: Service reliability refers to the situation whereby services are available when needed. It allows customers to have uninterrupted services (Galetzka *et. al.*, 2006). There is an expression that service reliability is satisfied when services are delivered to customers on time (Gunes and Deveci, 2002). In this study, reliability satisfaction aims at comparing on time availability of ferry services between short route and long route. According to SUMATRA (2010), there is a large number of short route service providers operating on short services compared to few ferries operating in long route services. Basing on this, the following hypotheses were formulated:

H_{4a}: There is a significant difference on reliability satisfaction between long routes and short routes.

H_{4b}.Reliability satisfaction increases in short routes compared to long routes.

Route type and safety satisfaction: Safety means protection of passengers' lives and their properties. It is very important to assess passengers' safety in maritime industry because absence of safety causes passengers' dissatisfaction. In order to ensure that passengers are free from harms, provision of safety instructions and rescue equipment seems to be crucial (Lu and Tseng, 2012). Safety training can improve passengers' safety consciousness and reduce damages in an accident (Lois *et. al.*, 2004). On this part, the study sought to compare safety satisfaction gained

among the two routes. According to BICO (2010), many short route service providers operating in Lake Victoria not unsafe and they are highly riskier than long route ferries. For that reason, the following hypotheses was formulated:

H_{5a}: There is a significant difference on safety satisfaction between long routes and short routes.

H_{5b}.Safety satisfaction decreases in short routes compared to long routes.

The Impact of Control Variable

Passengers' satisfaction in this study is mainly explained by route type. Apart from route type, it can be explained by other three socio-economic factors, namely, age, gender and monthly incomes. These three factors are called control variables because they can be used to provide alternative explanations on dependent variables instead of route types. For example, aged passengers are expected to be more satisfied with technology and safety satisfactions than young passengers. It is expected that in ferry transport services, males will be more satisfied in customer care, technology and convenience than females. It is expected that lower income earners are more satisfied with satisfaction dimensions than higher income earners who cannot be satisfied easily due to their economic status.

Research Methodology

The study used descriptive research, specifically cross sectional research because the research objectives and research questions were clearly identified and data collected only once. The study covered Mwanza and nearby islands. The choice of the area was based on nature of the problem. Mwanza has the highest demand for ferry services among Lake Victoria

regions with crucial connections to Bukoba, Musoma and other small islands found in Lake Victoria. Also, Mwanza was highly convenient for the researcher in terms of time and financial constraints. The study employed non-probabilistic sampling technique based on the subjective judgment to select individual respondents. The main reasons for using this technique are respondents' behaviour patterns and time constraints. It was assumed that some respondents would be reluctant in responding to questionnaires. In this study, both primary and secondary data were collected. For convenience and timely collection of primary data, the researcher employed a close-ended questionnaire to passengers on board and sometimes at the ferry terminals. This method was more appropriate to the study settings than other methods of administering questionnaires such as using mails or telephones (Churchill, 1999). Secondary data were collected from different institutions, websites and other relevant published materials. In addition to main data collection, the researcher also conducted a personal interviews with Lake Victoria zonal SUMATRA manager and SUMATRA seafarers' manager from headquarters in Dar es Salaam in order to gain further insights about ferry services on Lake Victoria.

Measurement of Variables

This study comprised three different variables, namely, an independent variable, dependent variables and control variables. There is only one independent variable (route type), five dependent variables, namely, convenience satisfaction, customer care satisfaction, technology satisfaction, reliability satisfaction and safety satisfaction. The three control variables were passenger's age, gender and income.

Dependent variables: The study comprised five customer satisfaction dimensions, namely, convenience, customer care, technology, reliability and safety. These dimensions reflect some categories used in existing

literature (Kai and Jen, 2006; Geetika and Nandeem, 2010; Irfan, 2012). All dimensions were measured using four items except for customer care that contains six items. To measure how passengers perceived satisfaction gained from those dimensions, a seven point Likert scale was used to rate their perceptions from 1, strongly dissatisfied to 7, strongly satisfied. Convenience satisfaction included four items, namely, seat comfort ability, shelter facilities, connection to other modes and stop near destination. Customer care satisfaction included the following six items: cleanness of the vessel, route time table awareness, passenger information, response and courtesy from staff, extra services offered and condition of toilets. Technology satisfaction included four items, namely, vehicle and infrastructure used, time to make a trip, travel speed and smoothness of the ride. Reliability satisfaction comprised service hours and days; punctuality; service on week end days; and boarding time used at the stations. Safety satisfaction included on board safety satisfaction instructions given to passengers, availability of safety satisfaction equipment such as life jackets, captains/drivers' competence and loading situations of the vessels.

Independent variable: The independent variable in this study was route type. In this study, route type was classified into two routes, namely, long route and short route. The main criterion used to differentiate between long route and short route was distance travelled. According to SUMATRA, any vessel carrying passengers that travel more than 46.3 nautical kilometres (25 nautical miles) are grouped as long route ferries while all vessels travel below 46.3 nautical kilometres are grouped as short route ferries. In the regression model, route type was introduced as a dummy variable, 1 for short route and 0 for long route to examine satisfaction gained from each dimension between two routes.

Control variables: The study comprised of three control variables, namely, age, income and gender. Respondents' age was categorized into the following four groups: below 18 years; from 18 years to 30 years; from 31 years to 60 years and respondents having 60 years and above. In data analysis, the age groups were coded from number 1 to number 4. Income was defined as an average amount of money, which a respondent earned per month. This variable was categorized into three groups and coded from number 1 to 3. The groups included those who earned less than 80,000 Tanzania shillings (Tshs), those who earned from 80,000 to 500,000 Tshs and those who earned more than 500,000 Tshs per month. Passengers were asked to indicate their gender, either male or female. In regression analysis, gender was introduced as a dummy variable where male was coded as 0 and female was coded as 1.

Data Analysis Tools

Collected data were analyzed quantitatively and qualitatively. Statistical Package for Social Sciences (SPSS) was used to manage and analyze the collected data. The study used independent mean test comparison to passengers' satisfaction levels between the two routes (see also Pallant, 2011). Furthermore, Regression analysis is used to investigate if there was a relationship between passengers' satisfaction and route type.

Results

Assessment of Data Quality

The collected data included an adequate sample size that involved 154 respondents. The sample included both long route passengers (61 respondents) and short route passengers (93 respondents). According to Tobachnik and Fidel (2007), in the multiple regression analysis, a rule of thumb based on the ratio of cases to independent variables is that N>50+8m,

where N is the number of sample size and m is the number of independent variables. Results from this study revealed that all regression models had a total of four predictor variables such that the minimum sample size of 82=50+ (8*4) was required. However, this study managed to have a total of 154 ferry passengers. Therefore, such sample met the requirement for multiple regressions.

Assessment of Assumption

Normality: In this study graphs, skewness and kurtosis were used to test normality of data. It is suggested that skewness index absolute value should not exceed 3.0 and kurtosis absolute value should not exceed 10.0 (Kline, 2005). In this output, Skewness maximum absolute value was 2.8, while kurtosis maximum absolute value was 9.0, which guarantee proof that data were normally distributed.

Multicollinearlity: All variables were subjected to multicollinearlity test. Multicollinearlity presents the relationship among variables and it exists when there is a significant correlation. Usually, existence of correlation between dependent and independent variables is expected but not among independent variables. The highest correlation is revealed when correlation among variables is more than 0.9 (r e" 0.9) (Pallant, 2010). In this study, correlation was examined and results are presented in Table 1.

Table 1: *Variables' Inter-correlation Matrix*

Factor	1	2	3	4	5	6	7	8	9
1Convenience	1	.629**	.141	-.088	.024	.085	.403**	-.543**	-.096
2Customer care		1	.285**	-.024	.090	.129	.478**	-.579**	-.047
3Technology			1	.151	.011	-.032	.114	-.301**	-.038
4Reliability				1	.341**	-.010	-.034	.334**	.030
5Safety					1	.091	.023	.042	.018
6Age						1	.116	-.054	-.069
7Monthly income							1	-.238**	-.046
8Short route								1	.136
9Female									1
Mean	**3.47**	**3.39**	**3.58**	**4.52**	**3.07**	**2.47**	**1.94**	**.60**	**.38**
Std. deviation	**.879**	**.830**	**.864**	**.715**	**.604**	**.607**	**.760**	**.491**	**.486**

**. Correlation is significant at the 0.01 level (2-tailed).

Respondents' Characteristics

Descriptive results showed that majority (62.3%) of respondents were male passengers (n=96) compared to female passengers (n=58) who accounted for 37.7 percent of the total sample. Findings showed 51.3 percent of the respondents' age ranged between 18 and 30 years, 42.9 percent of respondents' age ranged between 31 and 60 years. Each of the remaining age groups counted approximately at 3 percent. A bit over half (52%) of the respondents were working (employed and self-employed) followed by students (28%). The rest of the groups seemed to be fewer in number than the mentioned groups.

Descriptive Statistics

It is recommended that before data analysis, the data should be exposed to descriptive analysis in order to characterize them (Pallant,2011). Descriptive statistics produced in this study comprised means, standard deviation and range of scores (minimum and maximum).

Table 2: *Descriptive Statistics*

	N	Minimum	Maximum	Mean	Std. Deviation
Convenience	154	1	6	3.47	.883
Customer care	154	2	5	3.39	.830
Technology	154	2	6	3.59	.864
Reliability	154	2	6	4.52	.715
Safety	154	2	4	3.07	.604

Description of Passengers' Satisfaction Dimensions by Route Type

Descriptive analysis was performed to examine how respondents perceived satisfaction gained from ferry services. From the collected data the mean score in different service dimensions was computed (table 3) to analyze and make comparison on perceived passengers' satisfaction among the two routes.

Table 3: *Mean Comparison between Satisfaction Gained from the Two Routes*

Group Statistics	Route type	N	Mean	Std. Deviation	Std. Error Mean
Convenience satisfaction	long route	61	4.06	.881	.113
	short route	93	3.08	.635	.066
Customer care satisfaction	long route	61	3.98	.785	.101
	short route	93	3.00	.600	.062
Technology satisfaction	long route	61	3.91	.900	.115
	short route	93	3.37	.772	.080
Reliability satisfaction	long route	61	4.23	.744	.095
	short route	93	4.71	.629	.065
Safety satisfaction	long route	61	3.04	.773	.099
	short route	93	3.09	.464	.048

Source: Field Data 2013

Generally, results in Table 3 indicate that except for reliability satisfaction

and safety satisfaction in all other dimensions, long route scored higher than short route. Under reliability satisfaction, short route scored higher than long route, while safety satisfaction indicated no major differences between the two routes. To confirm existence of a satisfaction difference in the two routes, further statistical tests were carried out.

Testing of Mean Differences

An independent (t-test) was employed for significance of mean differences in satisfaction dimensions based on route type. Initially, Levene's test[1] was used to check for equality for variances as recommended by (Pallant, 2011). Table 4 presents results.

[1] "Levenes test is the test for checking equality of variances as a part of t test and analysis of variances analyses" (Pallant, 2011 page 207)

Table 4: *Statistical Significance Test*

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Technology	Equal variances assumed	4.890	.029	3.896	152	.000	.531	.136	.262	.800
	Equal variances not assumed			3.771	114.099	.000	.531	.141	.252	.809
Convinience	Equal variances assumed	23.358	.000	8.522	152	.000	.982	.115	.754	1.209
	Equal variances not assumed			7.869	95.153	.000	.982	.125	.734	1.230
Customercare	Equal variances assumed	6.269	.013	11.092	152	.000	1.042	.094	.856	1.228
	Equal variances not assumed			10.345	98.960	.000	1.042	.101	.842	1.242
Reliability	Equal variances assumed	2.688	.103	-4.386	152	.000	-.490	.112	-.710	-.269
	Equal variances not assumed			-4.238	113.426	.000	-.490	.116	-.719	-.261
Safety	Equal variances assumed	14.425	.000	-.520	152	.604	-.052	.100	-.249	.145
	Equal variances not assumed			-.471	88.518	.639	-.052	.110	-.271	.167

Based on Table 4, the Levene's test statistics indicate that except for reliability satisfaction, which met the assumption of equal variance between the groups, all other dimensions did not meet that assumption as indicated by their respective Levene's variance larger than the cutoff-point of 0.05 (see also Pallant, 2011). In that scenario, this study followed recommendations by Pallant (2011) and assessed significance of mean differences using t- values under equal variances not assumed for respective constructs that violated the equal variance assumption. Therefore, hypotheses H_{1a}, H_{2a}, H_{3a} and H_{4a} were supported at p less than 0.05, while hypothesis H_{5a} was not supported. These main results revealed that:

- H_{1a} : Convenience satisfaction is significantly different between the long route and short route passengers (mean difference = 0.982 t value = 7.869 $p < 0.05$ two-tailed).

- H_{2a} : Customer care satisfaction is significantly different between long route and short route passengers (mean difference= 1.042 t value = 10.345 $p < 0.05$ two-tailed)

- H_{3a} :Technology satisfaction is significantly different between long route and route passengers (mean difference= 0.531 t value = 3.771 $p < 0.05$ two-tailed)

- H_{4a}: Reliability satisfaction is significantly different between short route and long route passengers (mean difference=-0.490 t value = -4.386 $p < 0.05$ two-tailed).

The second objective of the study was to test passengers' satisfaction variation between long route and short route on different satisfaction dimensions. This objective was achieved by using a regression analysis

whereby each satisfaction dimension was regressed on route type, while age, income and gender were used as control variables. Regression analysis is a statistical tool concerned with investigation of the relationship between a set of variables (Sykes, 1992).

Estimation of Regression Models

The regression model used in this study took the following form:
$Y=a+ b_1X_1+ b_2X_2+ b_3X_3 + b_4X_4 + –$

Whereby
Y=Dependent variables*:* a=Constant*:* $X_1X_2…X_n$= Independent variables*:* – = Error term

Regression model: Satisfaction= $b_0+ b_1$Age+ b_2Female + b_3Income + b_4Short route+ –

Dependent variables: Convenience satisfaction, customer care satisfaction, technology satisfaction, reliability satisfaction and safety satisfaction.

Independent variable: Route type (dummy variable, 1 short route, 0 long route)

Control variables: Age, Income, gender (Dummy variable, 1 female, 0 male).

Hypothesis 1b Test
H_{1b}: Convenience satisfaction decreases in short routes as compared to long routes
Convenience satisfaction= 3.256 - 0.027 Female + 0.334Income + 0.036Age - 0.852shortroute+ –

Table 5 presents regression statistics for convenience satisfaction model. This seemed to satisfactory model as supported by an adjusted R^2 value of 0.361, which means that about 36 percent of convenience variation can be explained by the model. Also, the F-test showed fitness of the model as indicated by F-value (4, 154) = 22.640, p <0.01. Regarding the impact of route type, results showed convenience satisfaction for ferry passengers decreased in short routes compared to long routes (b = - 0.852, t = - 7.058, p<0.01). Therefore, hypothesis 1b is supported.

Table 5: *Convenience Satisfaction Model*

Model 1 R^2=0.378;R^2Adjust=0.361; F (4,154)=22.640,p = 0.000		Unstandardized Coefficients B	t- values	Collinearity Statistics	
				Tolerance	VIF
1	(Constant)	3.256	11.052***		
	Age	.036	.380	.982	1.018
	Monthly income	.334	4.302***	.933	1.072
	Female	-.027	-.231	.978	1.023
	short route	-.852	-7.058***	.927	1.078

***indicates p<0.01 (2-tail)

Hypothesis 2b Test

H2b: Technology satisfaction decreases in short routes compared to long routes

Technology satisfaction = 3.962 + 0.016female + 0.056Income - 0.070Age - 0.529shortroute + –

Table 6 presents regression statistics for technology satisfaction model. The model fitness is indicated by an adjusted R2 value of 0.0.075, which

means that 7.5 percent of variation in technology can be explained by the model. In addition, the F-test showed that the model is fit with F (4, 154) = 4.107, p <0.01). The negative coefficient of short route showed that technology satisfaction decreased in short routes compared to long routes and this is supported (b = - 0.529, t = -3.721, p<0.01).

Table 6: *Technology Satisfaction Model*

Model 2 R^2 =0.99,R^2Adjusted = 0.075 F (4, 154) = 4.107, p = 0.003		Unstandardized Coefficients B	t-values	Collinearity Statistics	
				Tolerance	VIF
1	(Constant)	3.962	11.411		
	Age	-.070	-.622	.982	1.018
	Monthly income	.056	.613	.933	1.072
	Female	.016	.113	.978	1.023
	short route	-.529	-3.721***	.927	1.078

***indicates p<0.01 (2-tail)

Hypothesis 3b Test

H_3b: Customer care satisfaction decreases in short routes compared to long routes

Customer care satisfaction = 2.904 + 0.070female + 0.387Income - 0.087Age - 0.840shortroute + –

Table 7 presents regression statistics for customer care satisfaction model. The fitness of the model is indicated by an adjusted R2 value of 0.449, which means that 44.9 percent of variation in customer care satisfaction can be explained by the model. Furthermore, the F-test showed that the model is fit with F (4, 154) = 32.158, p <0.01). The estimated coefficient of short route showed that customer care satisfaction decreased

significantly in short routes compared to long routes (b = -0.840, t = -7.970, p<0.01).

Table 7: *Customer Care Satisfaction Model*

Model 3 R^2 =0.463,R^2Adjust = 0.449 F (4, 154) = 32.158, p = 0.000		Unstandardized Coefficients B	t	Collinearity Statistics Tolerance	VIF
1	(Constant)	2.904	11.283***		
	Age	.087	1.051	.982	1.018
	Monthly income	.387	5.707***	.933	1.072
	Female	.070	.675	.978	1.023
	short route	-.840	-7.970***	.927	1.078

***indicates p<0.01 (2-tail)

Hypothesis 4b Test

H4b: Reliability satisfaction increases in short routes compared to long routes

Reliability satisfaction = 4.127 - 0.021female + 0.045Income + 0.003Age + 0.507shortroute + –

Table 8 presents regression estimates for reliability satisfaction model. The general fitness of the model is explained by adjusted R^2 value of 0.090, which describes that 9 percent of variation in reliability satisfaction can be explained by this model. Also, the F-test showed that the model is significantly fit with F (4, 154) = 4.790, p <0.01). The positive coefficient of short route indicated that reliability satisfaction increased significantly in short routes compared to long routes (b = 0.507, t = 4.339, p<0.01).

Table 8: *Reliability Satisfaction Model*

Model 4 R^2=0.114; AdjustedR^2= 0.090; F (4, 154) = 4.790, p = 0.001		Unstandardized Coefficients		Collinearity Statistics	
		B	t value	Tolerance	VIF
1	(Constant)	4.127	14.476***		
	Age	.003	.033	.982	1.018
	Monthly income	.045	.597	.933	1.072
	Female	-.021	-.186	.978	1.023
	short route	.507	4.339***	.927	1.078

***indicates p<0.01 (2-tail)

The Impact of Control Variables

In this study, age, gender and income were used as control variables while estimating effects of route type on different satisfaction dimensions. Among all three control variables, only monthly income indicated significant positive effects on convenience satisfaction ($_b$ = 0.334, t = 4.302, p<0.01) and customer care satisfaction (b= 0.387, t = 5.707, p<0.01). Both age and gender were insignificant to explain satisfaction perceptions.

Assessment of Multicollinearlity Problems in Regression Models

In addition to hypothesis testing, all models were checked for multicollinearlity problems using value inflation factor (VIF) and tolerance coefficients, which indicated no signs of multicollinearlity problems because they were all within the recommended cut-off points. All VIFs values were less than 10 and all tolerance values were greater than 0.1 (Pallant, 2011).

Discussions and Implications

From independent mean test as shown in Table 3, it can be observed that there is a statistical significant difference in the level of passengers satisfaction perceived between long route and short route passengers in four dimensions, namely, convenience satisfaction, customer care satisfaction, technology satisfaction and reliability satisfaction. The following values were obtained: convenience satisfaction (mean difference = 0.982, t value = 7.869, $p< 0.05$ two-tailed); customer care satisfaction (mean difference= 1.042, t value = 10.345, $p< 0.05$ two-tailed); technology satisfaction (mean difference= 0.531, t value = 3.771, $p< 0.05$ two tailed) and reliability satisfaction (mean difference=-0.490, t value = -4.386, $p< 0.05$ two tailed). These findings strongly support the formulated hypotheses 1a, 2a, 3a and 4a.

Regression analysis showed that passengers' satisfaction can be explained based on route type. The regression results provide evidence that among the five satisfaction dimensions, short route passengers were highly satisfied with service reliability ($b = 0.507$, $t = 4.339$, $p<0.01$) compared to long route passengers. In addition, results showed that short route passengers were less satisfied with convenience satisfaction (($b = -0.852$, $t = -7.058$, $p<0.01$), customer care satisfaction ($b = -0.840$, $t = -7.970$, $p<0.01$), and technology satisfaction ($b = -0.529$, $t = -3.721$, $p<0.01$) compared to long route passengers. This means that passengers perceived less satisfaction in the three service quality dimensions when they moved from long route ferry services to short route ferry services. Such perception differences could be due to the fact that passengers paid attention differently for various service dimensions, depending on time they spent in the ferry. In short route, the passengers may have limited time to create any expectations on available technology or provision of food and drinks or even availability of seats, but they were highly concerned with reliability of the services.

As highlighted before, many studies have been conducted to examine how service dimensions affect passengers' satisfaction without specifying their effect on each route type. This study has added an insight to the existing literature on how route type can affect passenger satisfaction.

Study Implications

The significant difference on passengers' satisfaction dimensions between two routes provides important implications to managers or operators of ferry companies in Lake Victoria. This implies that if they need to improve passenger satisfaction, among other things, they need to consider whether they operate in short route or long route. The positive association between short route and reliability satisfaction implies that managers of short routes should put more efforts on strategies that improve reliability of their services because reliability was of importance. However, managers of long route ferries need to pay more attention on improving reliability satisfaction of their ferry services such as punctuality, service on week end days, service hours and service days because their passengers indicated low satisfaction levels compared to short route passengers . The significant negative relationship between short route and convenience satisfaction, customer care satisfaction and technology satisfaction implies that managers of short route ferries need to improve more on these dimensions compared to long route ferries.

Findings from the study can also be useful to policy makers in Tanzania. It is suggested that policy makers should consider, among other aspects, route type in formulation and implementation of policy as well as directives for ferry services. It is interesting to note that ferry passengers in Lake Victoria were less concerned with safety, which is contrary to what literature would predict. The issue of safety is of paramount importance in Tanzania because, in recent years, the country experienced several fatal marine

accidents. Results from this study imply that in Tanzanian context, probably, authorities should not let market forces alone. Instead, policy makers should intervene and make appropriate policy tools that would promote safety in marine transport.

Study Limitations

The study coverage was limited to ferry services in Lake Victoria operated from Mwanza due to time and financial constraints. Other ferries in different regions were not included. Therefore, some findings from this study may not be generalizable. In this study, passenger satisfaction was narrowly defined into five dimensions. Some other dimensions such as security satisfaction could also be interesting but were not included in this study. According to Agrawal (2001), it is common for practical studies to address only a subset of elements mentioned in literature but such missing data certainly limit the study. Limited scientific literature to explain the research problem can be cited as another challenge in this study. Lack of scientific literature on how route type can be an explanatory factor in passenger satisfaction dimensions was quite a challenge.

Recommendations for Future Research

The study recommends further research to be conducted by assessing passenger satisfaction between private owned ferries and government owned ferries operating in the same route (either long route or short route). As mentioned in data analysis, the last regression model (safety satisfaction) indicated insignificant relationship route type. Therefore, it is suggested that this relationship may be tested in future studies.

References

Agrawal, A. (2001). "Common property institutions and sustainable governance of resources." *World Development* no. 29 (10):1623-1648.

Anderson, E, Fornell C., and Lehmann, D.(1994). "Customer satisfaction, market share and profitability: findings from Sweden. " *Journal of Marketing* No. 58 (3):53-66.

Barid,A.J. (2012). "Comparing the efficiency of public and private ferry services on the Pent land Firth between mainland Scotland and the Orkney Islands." *Research in Transportation Business & Management*.no.4:79-89.

Bergantino,A.S and S.Bolis. (2008)."Monetary values of transport service attributes":Land versus maritime ro-ro transport.An application using adaptive stated preferences.*Maritime policy and management*,35 (2) 159-174.

Berry, L, Parasuraman, A. , & Zeithal, V.. (1988). "Service quality puzzle." *Business horizons*:35-43.

Berry, L.L, K Seiders, and D Grewal. (2012). "Understanding service convinience satisfaction." *Journal of Marketing* no. 66:1-17.

BICO. (2011). Identifying transport pontential development areas. University of Dar es salaaam: University of Dar es Salaam.

Campbell, D. T. (1955). "The Informant in Qualitative Research." *The American Journal of Sociology* no. 60:339-342.

Cathy, S., W Sheng, and R.J Tsai. (2005). "Integrating perceived playfulness into expectation-confirmation model for web portal context." *Journal of Information & Management* no. 42 (5):683-693.

Churchill, G.A , and C Surprenant.(1982). "An Investigation into the determinants of Consumer Satisfactions." *Journal of Marketing Research* no. 19:491-504.

Churchill, G.A. Jr. (1999). *Methodological Foundations*. 7th edition ed. University of Wisconsin: The Dryden Press- Harcourt Brace College Publishers.

Clutterbuck,D.(1992).”Developing customer care satisfaction training programmes.” *The International Journal of Bank Marketing* no. 10 (7):17-17.

Colwell, S.R, A May, K Vinay, and L. H Alison. (2006). “Toward a measure of service convinience satisfaction: multiple-item scale development and empirical test.” *Journal of services marketing* no. 22 (2):160-169.

Daniels, Shirley. (1993). “Customer care satisfaction programmes.” *Work Study* no. 42 (1):12-12.

Frankfort-Nachmias, C. and D. Nachmias.(1996). *Research Methodsin the Social Sciences (5th ed.)*: St. Martin‘s Press.

Galetzka, Mirjam, W. M. Verhoeven Joost, and H. Pruyn Ad Th. (2006). “Service validity and service reliability satisfaction of search, experience and credence services.” *International Journal of Service Industry Management* no. 17 (3):271-271.

Gaur, A.S, and S.S Guar. (2006). *Statistical methods for practice and research- a guide to data analysis using SPSS*. New Delhi: Response Books/Sage Publications.

Geetika, and Nandan.S. (2010). “Determinant of customer satisfaction on service quality:A study of railway platform in India.” *Journal of Public Transportation* no. 13 (1):97-113.

Gronroos, C. (1984). “ A Service Quality Model and its Marketing Implications.” *European Journal of Marketing* no. 18 (4).

Gunes, Mustafa, and Ipek Deveci. 2002. “Quality and reliability satisfaction corner: Reliability satisfaction of service systems and an application in student office.” *The International Journal of Quality & Reliability satisfaction Management* no. 19 (2/3):206-211.

Hair, J.F, R.E Anderson, R.L Tatham, and W.C Black. (1998). *Multivariate data analysis*. 7 ed. New Jerse: Prentice-Hall.

Hamalos, Jane. (2013). Sumatra yapandisha nauli za mabasi,treni na meli

2013 [cited 8 May 2013]. retrie from http://www.mwananchi.co.tz/habari/Kitaifa/-/1597296/1737502/-/129d39r/-/index.htm.

Hirshleifer, Jack. (2001). *The dark side of the force "Economic foundation of conflict theory."* United kingdom: Cambridge University Press.

Holmgren, J. (2007). "Meta-analysis of public transport demand." *Transportation Research Part A,* no. 41 (10):1021-1035.

Irfan, S, M. H. K Daisy, and S Saman. (2012). "Service Quality and Rail Transport in Pakistan: A Passenger Perspective." *World Applied Sciences Journal* no. 18 (3):361-369.

Johan, N, T Rydberg, and A Sjobris. (1997). "Future short sea cargo ferry systems." *the Swedish transport and communication research board* no. 93:123-143.

Kai, C , and J William 2006. "Passengers' Perceived Service Quality of City Buses in Taipei: Scale Development and Measurement." *A Transnational Trans disciplinary Journal* no. 26 (5):645-662.

Kline, R. B. (2005). *Principles and practice of structural equation modeling*. 2 ed. New York: The Guilford Press.

Kothari, C. (2006). *Research methodology Methods and Techniques*. 2 ed. New Age, International (P) Limited, New Delhi.

Kotler, P. (2000). Marketing Management. In *New Jersey* Prentice Hall.

Kumar, K.S. (2012). "Exceptional and Perception of Service Quality with reference to public transport undertakings." *Journal of operational management* no. 11 (3):67-81.

Kumbhar, V. M. (2011). "Factors affecting the customer satisfaction in e-banking: some evidences form Indian banks." *Journal of management research and practice* no. 3 (4):1-14.

Lu, C.S , and P.H Tseng (2012). "Identifying crucial safety satisfaction assessment criteria for passenger ferry services." *Journal of Safety satisfaction Science* no. 50:1462-1471.

Malhotra, N. K, and D. F. Birks. (2006). *Marketing research: an applied approach (Updated 2nd European ed.)*. Essex, England: Prentice-Hall.

Mascati, I. (2007). "History of consumer demand theory 1871-1971,A neo-Kantian rational reconstruction." *Euro Journal history of economic thought* no. 14 (1):119-159.

Media, IPP. (2013). *Marking mv Bukoba sinking with unlearnt lesson* 2012 [cited 12 April 2013]. Retrieved from http://ippmedia.com/frontend/index.php?l=41743.

Mentzer, J.T., and D. J. Flint. (1997). "Validity in Logistics Research." *Journal of Business Logistics* no. 18 (1):199.

MoT. (2011). Fifty years of independence -Tanzania. Dar es salaam.

Mramba, C. (2012). *Meli za ziwa Victoria ni majeneza yanayoelea* 2012 [cited 24 April 2013].

MSA. (2003). Tanzania merchant shipping act In *21*, edited by Tanzania Ministry of Transport. Tanzania.

Myers, James H. (1991). "Measuring Customer Satisfaction: Is Meeting Expectations Enough?" *Marketing Research* no. 3 (4):35-35.

NBS. (2011). Tanzania figures by 2010. Dar es Salaam-Tanzania.

NBS. (2013). Tanzania census by 2012. edited by National bureau of statistics. Dar es Salaam,Tanzania.

Njoh, Ambe J. (1999). "Technology satisfaction-transfer and public transportation functioning in less developed countries: An exploratory study." *Journal of Third World Studies* no. 16 (1):187-207.

Nunnally, P. (1967). *Psychometric Theory*. 2 ed. New York: Mc Graw-Hill.

Oliver, R. L. (1980). "A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions." *Journal of Marketing Research* no. 17 (3).

Pallant, Julie. (2011). *SPSS Survival manual*. 4 ed. Australia: Allen and Uwin Book Publishers.

Parasuraman, A , V Zeithal, and L Berry (1985). "Conceptual model of service quality and implication for future research." *Journal of marketing* no. 49:41-50.

Sezzy, S. (2012). *Viroja vya usafiri wa meli ziwa victoria* 2011 [cited 18 October 2012].

Spreng , R. A, S.B Mackenzie, and R.W Olshavsky.(1996). "A reexamination of the determinants of consumer satisfaction." *Journal of marketing* no. 60 (3).

SUMATRA. (2009). Taarifa ya ubora wa huduma zitolewazo na meli ya Mv Liemba katika ziwa Tanganyika. Dar es Salaam-Tanzania: SUMATRA.

Sykes, Alan O. (1992). *"The Inaugural Coase Lecture; An Introduction to Regression. Analysis." Chicago Working Paper in Law & Economics*.

Tabachnik, B. , and Fidell, L.S. (2007). Using multivariate statistics. Sixth edition. Pearson international edition.

Tanzania Ministry of Transport official website Available from http:// www.mot.go.tz/index.php/mot/aboutus/category/overview

Thompson, K , and S Peter. (2007). "An investigation of the relationship between public transport performance and destination satisfaction." *Journal of Transport Geography* no. 15:136-144.

Tinali, Gerald Zachary. (2011). "Public road transport performance and travellers satisfaction in urban areas." Master degree thesis, University of Dar es Salaam.

University of South Florida. (2000). Transist customer satisfaction index. Florida: Department of Transportation State of Florida.

White, P. (2002). *Public Transport: Its planning, management and operation* 4ed. London.: SPON Press.