

# CUSTOMER SATISFACTION AND CUSTOMER LOYALTY IN VIETNAMESE MOBILE TELECOMMUNICATION INDUSTRY

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## ABSTRACT

*This study was aimed at investigating three factors (service quality, brand image and price perception) and assessed the degree of the impact of each factor on customer satisfaction, especially the relationship between customer satisfaction and customer loyalty in Vietnamese mobile telecom sector where there have been the existence of the fierce competition, mature market and internationally integrated economy, ultimately struggling for market share and survival. The results indicated that each factor (service quality, brand image, price perception) has a positive impact on customer satisfaction at the different level as well as a significantly positive relationship between customer satisfaction and customer loyalty in mobile telecommunication industry in Vietnam. The results of this study are consistent with the findings and evidence in the extant literature. The study provides the important feedback from customers to mobile telecom suppliers. Research findings are expected to be marketing insights for Vietnamese mobile telecom managers so that they can develop the sound marketing strategies in today's competitive and costly market.*

**Keywords:** service quality; brand image; price perception; customer satisfaction; customer loyalty; mobile telecommunication industry.

## 1. Introduction

Mobile telecommunication industry has been playing an economically important role in today's increasingly fast - growing society. Therefore, not surprisingly, this has inspired many researchers, marketers as well as management scholars to do many researches in this sector. Since the 1990s, mobile telecommunication service has soon become a dynamic sector of economic development in the industrialized nations. That is not only because of the rapid development of technology but also because of the increasing amount of network operators. In addition, the fiercely high competition among mobile telecom service providers is inevitable in this field.

It has been proved in many empirical studies that as market becomes increasingly competitive and difficult, the companies tend

to make many efforts to maintain the market share by focusing on satisfying and retaining the existing customers. Because of the high cost of reaching and attracting new customers, it is extremely important for companies to strategically concentrating on customer retention and customer loyalty. Hence, how to satisfy and make customers increasingly loyal is becoming a strategic goal for any business.

Vietnamese mobile telecommunication market is no longer a market of monopoly. Internationally-integrated economy has had an impact on mobile telecom industry in ever-fiercely competitive market. According to the Department of Telecommunications (Ministry of Information and Telecommunications), by the end of May 2013, the number of telephone subscribers on the entire network of Vietnam totaled 132.8 million. More particularly,

mobile subscribers occupied 122.79 million (92.5 percent) and 10 million was for landline subscribers (7.5 percent). With the population of approximately 88 million people, one person uses an average of about 1.5 mobile numbers (Ha, 2013).

In its report "Research and Markets: 2013 Vietnam Telecommunications Services Report", Business Wire (2013) stated that 2011-2012 was a busy and difficult period for the telecommunications sector in Vietnam. The mobile telecommunication industry has left its hot growth stage to dig deeper in the saturated area. There will be no more leapfrogging in revenue streams and the number of subscribers.

Obviously, mobile telecommunication service providers need to fully realize the relevance and significance of the oriented-customer business strategy as a condition for sustaining the competitive advantages and achieving profitable targets. When a number of subscribers reach a level of saturation, acquiring new customers is not only complicated but also costly from marketing point of view. It is widely believed that the fundamental marketing strategy in the future is to maintain the existing customers by capitalizing upon the customer satisfaction, thus leading to customer loyalty. As a result, the strategic focus of how to investigate the factors influencing on customer satisfaction and customer loyalty is a business and research necessity for management in mobile telecommunication industry.

Vietnamese mobile network suppliers have been struggling with the increasingly fierce competition at not only domestic level but also international level. In addition, there has been the state of the slower growth rate and saturated market. Under these circumstances, a defensive strategy is much more significant than an aggressive one, which expands the size of the overall market by persuading the potential customers (Fornell, 1992). Therefore, it would be time for management of each Vietnamese mobile network supplier to find out the best ways on how to keep, retain and satisfy customers, thereby making them to be more and more

loyal to mobile telecom services the operators provide, and more importantly, for customer profitability. Needless to say, deriving from managerial statement, it is imperative for mobile telecom service providers to investigate the main factors which affect customer satisfaction, thus creating customer loyalty in Vietnamese mobile telecom market.

Many researchers have especially emphasized and revolved around the importance of service quality, brand image and price perception in correlation with customer satisfaction and customer loyalty in service industry (Sureshchandar et al., 2002; Parasuraman et al., 1985; Saravana & Rao, 2007; Oliver, 1997; Han and Ryu, 2009; Hermann et al., 2007; Davies et al., 2003; Wu, 2011). Besides, the relationship between customer satisfaction and customer loyalty has been evaluated comprehensively in many studies (Szymanski and Henard, 2001; Guiltinan, Paul and Madden, 1997; Fornell, 1992; Oliver, 1999; Lee et al., 2001; Jones and Sasser, 1995; Bei and Chiao, 2001).

While the impacts of some main factors (such as service quality, brand image, price perception) on customer satisfaction as well as the relationship between customer satisfaction and customer loyalty have been interpreted and analysed in the many studies in developed countries mentioned above, there are very few studies on this in Vietnam, especially in mobile telecommunication industry. Therefore, it is determined that this study focuses only on three factors (service quality, brand image and price perception) to evaluate their impacts on customer satisfaction and customer loyalty in Vietnamese mobile telecommunication industry.

## **2. Literature review, hypotheses and research model**

### *Customer loyalty*

Oliver (1997, p.392) defined customer loyalty as a "deeply held commitment to rebury or repatronize a preferred product or service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior". Chu (2009) pointed

out that loyalty is a positive attitude and behavior related to the level of repurchasing commitment to a brand in the future. Loyal customers are less likely to switch to a competitor solely because of price, and they even make more purchases than non-loyal customers. Loyal customers are considered to be the most important assets of a company. Therefore, not surprisingly, Tseng (2007) said that it is extremely important for companies to keep loyal customers who will contribute long-term benefits to the business organizations.

To enhance the financial growth of a company, thing should be done is to make existing customers increase their purchases (Hayes, 2008). Moreover, organization's financial growth is dependent on a company's competency to retain existing customers at a faster rate than it acquires new ones (Hayes, 2008). Hence, management should understand that the road to growth is to focus on customers – not only attracting new customers but also maintaining existing customers, motivating them to spend more and getting them to recommend products and services to the other people (Keiningham *et al.*, 2008).

According to Aydin and Ozer (2005), customer loyalty has been generally divided into attitudinal loyalty and behavioral loyalty. They stated that attitudinal loyalty describes customer's attitude toward loyalty by measuring customer preference, buying intention, supplier prioritization and recommendation willingness. Meanwhile, behavioral loyalty relates to shares of purchase, purchasing frequency. Wulf *et al.* (2001) defined the construct of behavioral loyalty as a composite measure based on a consumer's purchasing frequency and amount spent at a retailer compared with the amount spent at other retailers from whom the consumer buys. Morgan and Hunt (1994) found significant relationships between the level of a buyer's relationship commitment and his acquiescence, propensity to leave, and cooperation, all of which can be regarded as behavioral outcomes of relationships.

Conceptualization and measurement of loyalty concept has become more and more complex (Jones and Taylor, 2007). Reichheld

(2003) found that, in service industry, loyalty can be measured by one special indicator-willingness to recommend. Ball *et al.* (2004) reviewed the literature related to the determinants of loyalty, not only in the business-to-business but also in business-to-consumer cases. They stated that investigating customer loyalty and its antecedents in the different markets and countries may produce significant variance in the loyalty interpretation. Jacoby and Kyner (1973) emphasized that loyalty has to be: biased, behavioural response, expressed over time, by some decision-making units, with respect to one or more alternative brands out of a set of such brands and a function of psychological processes.

#### *Customer satisfaction and customer loyalty*

The most widely accepted conceptualisation of the customer satisfaction concept is the expectancy disconfirmation theory. This theory was invented by Oliver (1980), who suggested that satisfaction level is a result of the difference between expected and perceived performance. Satisfaction (positive disconfirmation) occurs when product or service is better than expected. Conversely, a performance worse than expected results in dissatisfaction (negative disconfirmation).

Fornell (1992) defined satisfaction as an overall evaluation dependent on the total purchase. Fornell (1992) also found that high customer satisfaction will lead to the increased loyalty for the company and, more importantly, customers will be less likely to make overtures to competitors. Likewise, Jones and Sasser (1995) described that an increase in customer satisfaction brings about a stronger influence on loyalty among customers who are at the high end of the satisfaction scale.

Guiltinan, Paul and Madden (1997) also investigated that satisfied customers tend to be repeated (and even become loyal) customers and are less likely to switch to other service providers. Many scholars have believed that customer satisfaction is one of the best indicators of a company's future profit and competitiveness. The results of customer

satisfaction include customer loyalty (Bei and Chiao, 2001). Both marketing academics and professionals have aimed to identify the most noticeable determinants of customer loyalty. Researchers have recognized a bond between customer satisfaction and loyalty. In meta-analysis study, Szymanski and Henard (2001) demonstrated 15 positive and significant interconnections between the two constructs. Bearden and Teel (1983) have also indicated a relationship between satisfaction and loyalty. Meanwhile, Jones et al. (1995) found out that this relationship is not a simple linear one and the resulting behaviors may depend on consumer attributions (their belief in the causes of the customer satisfaction and dissatisfaction assessment). Furthermore, some academics pointed out that switching costs, a moderating variable, can substantially impact customer loyalty through customer satisfaction (Fornell, 1992; Oliver, 1999; Lee et al., 2001) and perceived value (Woodruff, 1997; Neal, 1999). Evidently, it is widely recognized that customer satisfaction is a driver of customer loyalty. However, the number of findings in services marketing literatures and empirical studies over the past decade has shown that, in service industry, customer satisfaction and loyalty do not always correlate positively (Silvestro and Cross, 2000; Kamakura, 2002; Pritchard and Silvestro, 2005).

Based on literatures and findings on customer satisfaction and customer loyalty discussed above, the hypothesis is proposed in Vietnamese mobile telecommunication industry:

***H4: Customer satisfaction has a positive impact on customer loyalty***

*Service quality and customer satisfaction*

Gronroos (2000, p.46) stated that “a service is a process consisting of a series of more or less intangible activities that normally, but not necessarily always, take place in interactions between the customers and service employees and/or physical resources or goods and/or systems of the service provider, which are provided as solutions to customer problems”. This definition showed that service is a process in which interactions between customer and service provider most often exist. Hence, in a service context, relationship

between customer and service provider can be utilized as a basis for marketing strategies (Gronroos, 2000).

Service quality is defined as “an overall assessment of services by the customers”(Ganguli & Roy, 2010, p.405). In service industry, service quality is evaluated by interaction and interconnection between customers and firm employees. This implies that “quality evaluations are made not solely on outcomes of a service, they also involve the evaluations of process of service delivery”(Parasuraman, Zeithaml and Berry, 1988, p.42). It is also stated that service quality is a critical and indispensable factor in persuading customers to use a particular service provider instead of another (Kandampully, 1998). With respect to the relationship between customer satisfaction and service quality, Oliver (1993) first maintained that service quality would be a determinant of customer satisfaction irrespective of whether these constructs were cumulative or transaction-specific. Some researchers have identified the empirical evidences for the viewpoint mentioned above (Anderson & Sullivan, 1993; Fornell et al 1996; Spreng & Macky 1996) in which customer satisfaction came as an outcome of service quality.

Although it is proven that other factors such as price and product quality can impact on customer satisfaction, service quality is a antecedent to customer satisfaction (Zeithaml et al., 2006). This finding is in line with the invention of Wilson et al. (2008) and has been supported by the definition of customer satisfaction demonstrated by other researchers. It is evident that, based on past studies of service quality and customer satisfaction, customer satisfaction and service quality themselves are interconnected from their definitions to relationships. Parasuraman et al. (1985) explained that when perceived service quality is high, then it will lead to increase in customer satisfaction. Some other scholars did grasp the idea proposed by Parasuraman(1995) and they significantly recognized that “Customer satisfaction is based upon the level of service quality that is provided by the service providers” (Saravana & Rao, 2007, p.

436; Lee et al., 2000, p. 226). Sureshchandar et al. (2002) in their research on relationship of customer satisfaction and service quality, pointed out that these two variables are positively related, confirming that the definitions of both variables are always been connected. They also determined that “service quality is more abstract, since it may be influenced by perceptions of value or by the experiences of others that may not be so good, than customer satisfaction which reflects the customer’s feelings about many encounters and experiences with service firm”. (Sureshchandar et al., 2002, p. 372).

Therefore, based on literature review mentioned above, the hypothesis is proposed in Vietnamese mobile telecommunication industry:

***H1: Service quality has a positive impact on customer satisfaction***

***Price perception and customer satisfaction***

Zeithal (1988, p.10) has defined the price as “ what is given up and sacrificed to obtain a product”. Price is an essential determinant of customer satisfaction as it is extrinsic indicator of quality. Jacoby and Olson(1977) distinguished price as objective price and perceived price. They defined objective price as the actual price of a product or service. Meanwhile, perceived price is the price that is encoded by consumer (Zeithaml, 1988). Chang and Wildt(1994) defined the perceived price as consumers’ perceptual representation or subjective perception of the objective price of product or service. Varki and Colgate (2001) stated that price perception is created in comparison with the internal reference prices.

Customers tend to choose their service providers based on the perceived price. Because of different needs and wants among individuals, how much consumers are willing to pay for the same service is to vary. Higher price perception might negatively affect purchasing probabilities (Peng and Wang, 2006). Perceived price is also found to be related to price searching (Lichtenstein *et al.*, 1993). The likelihood is that consumers usually are attracted by perceived high-quality

services at perceived competitive prices during the searching process.

Oliver (1997) stated that consumers often evaluate the price in relation to service quality, thus generating satisfaction or dissatisfaction. If consumers see price to be fair, they are more likely to enter into transactions with the service providers. Based on previous researches, Cheng *et al.* (2008) suggested that perceived price can be measured by two constructs: one is rationality of prices, which reflects the way that price is perceived by customers compared with that of competitors; another is value for money, which implies the relative status of the service provider in terms of price. Many researchers have maintained that price perception affects customer satisfaction (Oliver, 1997; Peng and Wang, 2006; Cheng *et al.*, 2008; Kim *et al.*, 2008). Peng and Cheng (2006) believed that customers often switch to another service providers mainly because of some pricing issues such as high price perception, unfair or deceptive pricing policies. In service industry, Singh and Serdeshmurkh (2000) have also pointed out that price significantly influences customer satisfaction. Han and Ryu (2009) identified that price perception impacts considerably on customer satisfaction in restaurant industry. Hermann et al. (2007) found that perceived price has a positive influence on customer satisfaction. Therefore, the hypothesis is proposed in Vietnamese mobile telecommunication industry:

***H2: Price perception has a positive impact on customer satisfaction***

***Brand image and customer satisfaction***

Brand concept has been usually interpreted and analyzed in marketing literatures. Not only is brand building a pivotal driver for marketing physical products, it is but also an important issue for service firms. Keller (1993, p3) defined brand image as “the perceptions about a brand held in consumers’ memory”. A similar definition to Keller’s was suggested by Aaker (1991), whereby brand image is mentioned as “a set of associations, usually organized in some meaningful way” (p. 109). Furthermore, Biel (1992) defined

brand image as "a cluster of attributes and associations that consumers connect to the brand name" (p. 8).

Gronroos (2000, p.287) stated that "A brand is not first built and then perceived by the customers. Instead, every step in the branding process, every brand message, is separately perceived by customers and together add up to brand image, which is formed in customers' mind". Hence, brand image is an outcome of how a customer makes perceptual relationship with a brand over time. The advancement of a brand relationship with customers is based on a series of brand contacts experienced by customers (Gronroos, 2000). Importantly, service providers need to form a positive brand image in customers' mind, thus conveying brand value to customers and creating a supportive word of mouth among people.

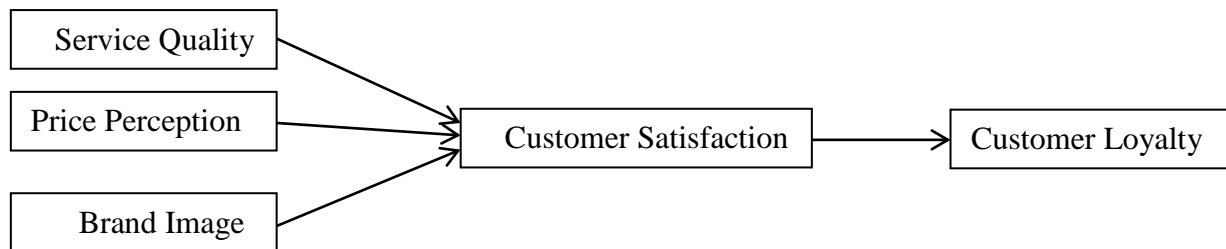
Corporate brand image has been

evaluated as an important antecedent of customer satisfaction and loyalty (Wu, 2011). Davies et al. (2003) noted that there has been a positive relationship between corporate brand image and satisfaction. Martineau (1958) said that if consumers advocate image of the store, they will be more likely to develop a certain degree of satisfaction and loyalty. Selnes (1993) also determined the impact of brand image on customer satisfaction. However, Davies and Chun (2002) maintained that brand image had an indirect impact on brand loyalty via customer satisfaction.

Therefore, the hypothesis is proposed in Vietnamese mobile telecommunication industry:

**H3: Brand image has a positive impact on customer satisfaction**

Based on the literature review and hypotheses mentioned above, research model is proposed as follows:



**Figure 1. Research model**

### 3. Research methodology

#### *Target population*

The objective of this study is to determine the degree of the impact of service quality, brand image and price perception on customer satisfaction and customer loyalty in Vietnamese mobile telecommunication sector. Therefore, the customers who are using mobile telecommunication services (such as Viettel, Vinaphone, Mobiphone, Vietnamobile and Gmobile) are target sample population of this research.

#### *Measurement scale*

Scales of this study were based on theories, findings and scales that many researchers used in their empirical studies. Most of scales were borrowed from Godfred et al. (2012), who also adapted the scales from

the other researchers: *Service quality* was measured by 4 items (SQ1, SQ2, SQ3, SQ4) adapted from Gronroos(2000); *Price perception* was measured by 3 items (PP1, PP2, PP3) adapted from Cheng et al.(2006); *Brand image* was measured by 4 items (IM1, IM2, IM3, IM4) adapted from Gronroos(2000); *Customer satisfaction* was measured by 4 items (CS1, CS2, CS3, CS4) adapted from Oliver (1997) and Fornel(1992); *Customer loyalty* was measured by 5 items (CL1, CL2, CL3, CL4, CL5) adapted from Aydin and Ozer (2005). The author used five-point Likert scale from 1-strongly disagree to 5-strongly agree to investigate the opinions of respondents as a scale measurement.

*Qualitative research and quantitative research*

First of all, preliminary scale was suggested for questionnaires of study. Next, the in-depth interview was conducted with 10 respondents (2 managers of mobile telecommunication companies and 8 customers using mobile telecom services). Participants were required to review the meaning of scales (measurable items) and recommend modifying the scales if necessary in order to remove ambiguities and enhance the clarity of scales. The outcomes, recommendations and feedbacks of in-depth interview had been recorded, thus developing, modifying and qualifying the draft questionnaires (scales) before they were officially launched in main research. The results of qualitative research was presented in the appendix A *“Guideline for a qualitative in-depth interview”*.

Based on the results of the preliminary research, questionnaires were modified again to make sure that the ambiguity of questionnaire has to be removed, thus helping respondents understand questionnaires easily and transparently. When questionnaires were well designed, the main research was conducted. The 450 questionnaires of hard copies were sent out to customers who have been using the mobile telecommunication services. The author received back 406 questionnaires with the percentage of responses of 90% (406/450). After examining carefully, 18 of the answered questionnaires had the errors and the incomplete responses, thus removing from the list of responses. Ultimately, the valid sample size of this study is 388.

#### *Data analysis method*

- Data was analyzed by SPSS software, version 16.0, which enables the Exploratory Factor Analysis(EFA), Cronbach's alpha Analysis and Standard Multiple Regression.
- Cronbach's alpha Analysis was used to test reliability of measurement scales.
- Exploratory Factor Analysis (EFA) was employed to explore the inter-relationships among variables to

identify the number of underlying factors. Principle Component Analysis (PCA) was used as a method to extract the factors in this study, together with Varimax as a rotation technique.

- Multiple regression was used to test research model and hypotheses.

#### **4. Data analysis and findings**

##### *Descriptive statistics of research samples*

450 questionnaires were administered to customers of mobile telecommunication companies in Ho Chi Minh city. There were 406 responses in which 18 of responses were incomplete. Therefore, a number of valid responses were 388. Out of 388 responses, 30% were Viettel, 34% were Vinaphone, 27% were Mobilphone, 5% were Vietnamobile and 4% were Gmobile. In terms of method of payment for mobile services, the vast majority of customers (77%) in this study chose the way of “prepaid”, while only 23% used “paid after” service. About duration of service usage, it is noticeable that the numbers of customers using mobile service for 3-5 years were highest, at 37%, and followed by group of 1-3 years, 19%. Meanwhile, the figures for respondents using mobile services for “<1 year” and “5-10 years” were almost similar, 13% and 12% respectively. Customers who used mobile services more than 10 years were only about 9%.

From educational point of view, not surprisingly, the figure for respondents who earned Bachelor degree was highest, around 57%. In contrast, the figures for mobile customers who belonged to “below high school diploma”, “high school” and “master degree and upper” group were relatively low, at 2%, 5% and 8% respectively. Customers with Associate degree accounted for 28%. About gender, while the large number of respondents were male (65%), the figure for female customers was 35%. In this survey, markedly, the percentage of mobile customers from 20 to 39 years old was overwhelmingly high, at about 84%, in compared to group less than 9 years old and group more than 40 years old, with 9% and 7% respectively. The

result showed that only half the respondents had income per month from 5 million VND to 10 million VND, with 56%. However, the proportion of respondents who have high income (more than 15 million VND) was lowest, 9%. Mobile customers who fell into 5-10 million group accounted for 21%, compared with 14% for less than 5 million group.

*Reliability test: Cronbach's alpha test*

The Cronbach's Alpha test helps to

remove the unsuitable scales. If correlation of each specific item with total of the other items in scales is moderately high or higher above 0.3 (Burnstein and Nunnally, 1994), the item is probably at least moderately correlated with most of other items and will make a good component of this summated rating rate. If the item-total correlation is negative or too low (less than 0.3), it is required to examine the item for wording problems or conceptual fit.

**Table 1. Reliability Test Result**

Description	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
<i>Service quality</i>	<i>Alpha=0.773</i>			
SQ1	10.7474	4.391	.575	.720
SQ2	10.6701	4.403	.671	.668
SQ3	10.8557	4.635	.587	.713
SQ4	10.6237	5.078	.477	.767
<i>Brand image</i>	<i>Alpha=0.781</i>			
IM1	10.8557	4.821	.526	.759
IM2	11.0747	4.943	.585	.729
IM3	10.9098	4.625	.631	.704
IM4	10.5902	4.594	.606	.717
<i>Price perception</i>	<i>Alpha=0.746</i>			
PP1	6.6933	2.399	.623	.601
PP2	6.7216	2.408	.605	.622
PP3	6.4149	2.719	.493	.750
<i>Customer satisfaction</i>	<i>Alpha=0.816</i>			
CS1	10.3814	4.640	.599	.787
CS2	10.3222	4.446	.690	.742
CS3	10.2448	4.713	.659	.758
CS4	10.2242	4.846	.599	.785
<i>Customer loyalty</i>	<i>Alpha=0.843</i>			
CL1	13.7887	8.229	.677	.802
CL2	14.0387	8.601	.554	.838
CL3	13.8686	8.729	.657	.809
CL4	13.8376	8.312	.705	.795
CL5	13.8789	8.572	.658	.808

#### ❖ *Service quality*

Service quality is composed of four items. To assess whether the four items that

were summed to create the score of service quality formed a reliable scale, Cronbach's alpha was computed. The alpha for four items



was 0.773, which indicates that the items form a scale that has reasonable internal consistency reliability. The corrected item-total correlation of each item was above 0.3, which is suitable to make a scale of service quality.

#### ❖ *Brand image*

Brand image is composed of four items. It was tested whether these items go together (interrelate) well enough to add them for the use as a composite labeled "brand image". The Alpha for four items was 0.781, which indicates that three items are acceptable to make a composite of "brand image". Obviously, the alpha of brand image is higher than alpha of service quality. The corrected item-total correlation of each item was above 0.3, which is acceptable to make a scale of brand image.

#### ❖ *Price perception*

Price perception is composed of only three items. The author tested whether these three items can go together (interrelate) good enough to add them for the use as a composite labeled "price perception". The Alpha for three items was 0.746. It means that three items can be used to measure the construct of "price perception". The corrected item-total correlation of three items was higher than 0.3, which is suitable to make a reliable scale for measuring "price perception".

#### ❖ *Customer satisfaction*

Customer satisfaction consists of four items. It is necessary to test whether these four items can go together (interrelate) good enough to add them for the use as a composite labeled "customer satisfaction". The Alpha for four items was 0.816, which indicates that

these items form a scale that has a high internal consistency reliability. The corrected item-total correlation of four items was above 0.3, which is acceptable.

#### ❖ *Customer loyalty*

Customer loyalty is composed of five items. The Alpha for the five items was rather high (0.843). The corrected item-total correlation of five items was above 0.3. All requirements were met. Hence, it is totally acceptable when using this scale for measuring "customer loyalty".

In conclusion, Cronbach's Alpha of five scales was above 0.7 and the corrected item-total correlation of all items was higher than 0.3. It means that all scales fit requirement for reliability test. Therefore, these measurement scales were used to conduct the official research with the aim of testing hypotheses.

#### *Exploratory Factor Analysis (EFA)*

##### *EFA for independent variables*

Based on the test of assumption, KMO value was 0.879 at the Barlett's Test Significance of  $.000 < 0.05$ . Therefore, it met the conditions require by the EFA method. KMO value of 0.879 indicated sufficient items for each factor. The Barlett was significant, meaning that the variables were correlated highly enough to provide a reasonable basis for factor analysis. By doing EFA (principal component analysis, rotation method: Varimax), it extracted three factors (service quality, price perception and brand image) from 11 items. It was noted that all of three factors had eigenvalues larger than 1.0 (4.672; 1.238; 1.131), which is a common criteria for a factor to be useful (presented in Table 2).

**Table 2. Total variance explained of independent variables**

Components	Initial eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.672	42.471	42.471	4.672	42.471	42.471	2.470	22.459	22.459
2	1.238	11.254	53.725	1.238	11.254	53.725	2.451	22.281	44.740
3	1.131	9.375	63.100	1.131	9.375	63.100	2.020	18.360	63.100

Extraction Method: Principal Component Analysis.

The cumulative of three factors accounted for 63.1%. The Rotated Factor Matrix displays the items and factor loadings for rotated factors. Normally, loading larger

than 0.4 is acceptable. It is noticeable that 11 items were clearly clustered into three groups of service quality, brand image and price perception defined by high loadings.

**Table 3. Rotated component matrix of independent variables**

Description		Component		
		1	2	3
Brand image	IM3	.804		
	IM4	.759		
	IM2	.672		
	IM1	.649		
Service quality	SQ3		.769	
	SQ2		.767	
	SQ4		.671	
	SQ1		.646	
Price perception	PP2			.878
	PP1			.819
	PP3			.540

Extraction Method: Principal Component Analysis; Rotation Method: Varimax

❖ *EFA for mediator variable- Customer satisfaction*

KMO was 0.793, which indicated sufficient items for each factor. The Barlett's test of Sphericity was significant (.000), which means that the variables are correlated highly

enough to provide a reasonable basis for factor analysis. The eigenvalue was larger 1.0 (2.583) and four variables measure one factor of customer satisfaction with 64.57 percent of variance extracted. Loadings for four items were high enough:

**Table 4. Component matrix of mediator variable-customer satisfaction**

Description	Component
	1
CS2: I am satisfied with the professional competence of supplier X	.842
CS3: I am satisfied with the performance of the frontline employees of supplier X	.822
CS4: I am comfortable about the relationship with supplier X	.775
CS1: I am satisfied with the overall service quality offered by supplier X	.773

Extraction Method: Principal Component Analysis; 1 component extracted.

❖ *EFA for dependent variable-customer loyalty*

The result of EFA showed that there was only one factor underlying this construct in which the five items measure customer

loyalty(accounted for 61.83 % of variance extracted) with eigenvalue larger than 1.0 (3.092) and KMO value of 0.849 at the significance of 0.000. Loadings for five items were enough high:

**Table 5. Component matrix of dependent variable-customer loyalty**

Description	Component
	1
CL4: I am willing to say positive things about supplier X to other people	.832
CL1: I intend to continue using mobile services from this operator for a long time	.805
CL5: I will encourage friends and relatives to use the services offered by supplier X	.794
CL3: Even if another operator' price is lower, I will go on using supplier X	.794
CL2: If I want an additional telecom service, I am willing to continue selecting supplier X	.700

Extraction Method: Principal Component Analysis; 1 component extracted.

### ***Hypotheses testing***

#### ***Testing the assumption of multiple regression***

When running multiple regression, multicollinearity must be put much attention to as this problem can lead to inaccurate results. Multicollinearity problem occurs in case there are high inter-correlations among the

independent variables. Pearson Correlation below (presented in Table 6) indicates a low correlation (lower than 0.8) among predictor variables. When the assumption of Standard Multiple regression was met, a further analysis on the regression results was proceeded to test the research hypotheses.

**Table 6. Pearson correlation**

		Service quality	Brand image	Price perception
Service quality	Pearson Correlation	1	.588**	.492**
	Sig. (2-tailed)		.000	.000
Brand image	Pearson Correlation	.588**	1	.475**
	Sig. (2-tailed)	.000		.000
Price perception	Pearson Correlation	.492**	.475**	1
	Sig. (2-tailed)	.000	.000	

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

#### ***Testing hypotheses on the impacts of factors (service quality, brand image, price perception) on customer satisfaction:***

According to the analysis in previous

section, the author decided the final model for the study with three factors as independent variables: service quality, brand image, price perception.

**Table 7. Model summary of testing hypotheses on the impacts of factors (service quality, brand image, price perception) on customer satisfaction**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.733 <sup>a</sup>	.538	.534	1.90683

a. Predictors: (Constant), Price perception, Brand image, Service quality

The Model summary table showed that the multiple correlation coefficient (R), using all the predictor simultaneously, was

0.733. The Adjusted R Square was 0.534, which indicates that 53.4% of variance in customer satisfaction can be predicted from

the independent variables combined (price perception, brand image, service quality). The model for this study is strongly suitable.

**Table 8. ANOVA<sup>b</sup> Result of Testing hypotheses on the impacts of factors (service quality, brand image, price perception) on customer satisfaction**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1625.275	3	541.758	148.999	.000 <sup>a</sup>
	Residual	1396.217	384	3.636		
	Total	3021.492	387			

a. Predictors: (Constant), Price perception, Brand image, Service quality

b. Dependent Variable: Customer satisfaction`

The ANOVA table shows that  $F=148.99$  and is significant. This indicates that the combination of the predictors significantly (.000) predicts customer satisfaction.

**Table 9. Coefficients<sup>a</sup> Result of Testing hypotheses on the impacts of factors (service quality, brand image, price perception) on customer satisfaction**

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.	Collinearity Statistics	
		B	Std. Error	Beta	t		Tolerance	VIF
1	(Constant)	1.439	.589		2.442	.015		
	Service quality	.310	.045	<b>.307</b>	6.834	.000	.596	1.678
	Brand image	.344	.044	<b>.345</b>	7.764	.000	.609	1.643
	Price perception	.289	.052	<b>.232</b>	5.610	.000	.705	1.419

a. Dependent Variable: Customer satisfaction`

According to the Coefficients matrix, three factors (service quality, brand image and price perception) were positively related to customer satisfaction because all Standardized Coefficients Beta are positive. Especially, sig. is .000( $p<0.05$ ), indicating that Service quality, brand image and price perception were significantly contributing to the equation for predicting customer satisfaction. It means that all of three factors examined in this study are the meaningful factors to customer satisfaction in mobile telecommunication industry. In the other word, if we increase the level of service quality, price perception and brand image, customer satisfaction will improve. Among three factors that influence on customer satisfaction, Coefficients Table shows that Brand image (Coefficient Beta=0.345) is the factor that has the highest

positive impact on customer satisfaction from the viewpoint of customers in Vietnamese mobile telecommunication sector. The factor that has the second high influence on customer satisfaction is Service quality (Coefficient Beta=0.307). It implies that, in mobile telecom sector, if we enhance the level of service quality, customer satisfaction will improve. The third factor, Price perception, is believed to be a factor that has the lowest positive impact on customer satisfaction in this study with Coefficient Beta of 0.232. It is also noted that, in Vietnamese mobile telecommunication industry, if price perception increases from point of view of customers, customer satisfaction will develop.

*Testing hypothesis on the impact of customer satisfaction on customer loyalty*

**Table 10. Model Summary of Testing hypothesis  
on the impact of customer satisfaction on customer loyalty**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.692 <sup>a</sup>	.478	.477	2.58337

a. Predictors: (Constant), Customer satisfaction

The Model Summary table showed the results of R=0.692 and Adjusted R Square=0.477, which represented that the impact of predictor variable (Customer satisfaction) on dependent variable (Customer

loyalty) was rather strong and the model could explain 47, 7% of variance in Customer loyalty in Vietnamese mobile telecommunication industry.

**Table 11. ANOVA<sup>b</sup> Results of Testing hypothesis  
on the impact of customer satisfaction on customer loyalty**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2362.546	1	2362.546	354.004	.000 <sup>a</sup>
	Residual	2576.081	386	6.674		
	Total	4938.626	387			

a. Predictors: (Constant), Customer satisfaction`

b. Dependent Variable: Customer loyalty

The ANOVA table shows that F=354.004 and is significant. This indicates that the predictor variable customer

satisfaction significantly (.000) predicts dependent variable of customer loyalty.

**Table 12. Coefficients<sup>a</sup> Result of Testing hypothesis  
on the impact of customer satisfaction on customer loyalty**

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.	Collinearity Statistics	
		B	Std. Error	Beta	T		Tolerance	VIF
1	(Constant)	5.217	.658		7.927	.000		
	Customer satisfaction`	.884	.047	<b>.692</b>	18.815	.000	1.000	1.000

a. Dependent Variable: Customer loyalty

The standardized Coefficient Beta value of customer satisfaction provided in Table 4.13 was 0.692 at the Sig. value of 0.000, indicating that Customer Satisfaction has a positive impact on customer satisfaction in Vietnamese mobile telecom sector.

#### *Summary of hypotheses testing results*

The results of hypotheses testing were presented in Table 4.14. Three Hypotheses H1, H2, H3 were supported while Hypothesis H4 was strongly supported.

**Table 13. Results of hypotheses testing**

No.	Hypotheses	Standardized Coefficient (Beta)	Sig.(p-value)	Tested Results
H1	<i>Service quality has a positive impact on customer satisfaction</i>	<b>0.307</b>	0.000	Supported
H2	<i>Price perception has a positive impact on customer satisfaction</i>	<b>0.232</b>	0.000	Supported
H3	<i>Brand image has a positive impact on customer satisfaction</i>	<b>0.345</b>	0.000	Supported
H4	<i>Customer satisfaction has a positive impact on customer loyalty</i>	<b>0.692</b>	0.000	Strongly Supported

## 5. Conclusions, implications and limitations

### *Conclusions*

The critical aim of this study is to investigate the determinants of customer satisfaction that has influence on customer loyalty in Vietnamese mobile telecommunication industry. In this study, three factors affecting customer satisfaction are suggested: service quality, brand image and price perception, and then this research defines the level and the important impact of customer satisfaction on customer loyalty. After collecting and analyzing the data, some important results are found.

The result of this study demonstrates a positive correlation between three factors (service quality, brand image and price perception) and customer satisfaction in Vietnamese mobile telecommunication industry. It means that if each of these three factors is improved, customer satisfaction will be improved. Each factor makes the different level of impact on customer satisfaction. More specifically, among three factors, brand image is the most important factor that has a strongly positive effect on customer satisfaction (Coefficient Beta=0.345). It implies that, in Vietnamese mobile telecom sector, if mobile telecom companies know how to develop the brand image in the mind of customer, it will lead to an increase in customer satisfaction. Service quality has a second strong effect on customer satisfaction in mobile telecom context (Coefficient Beta=0.307). It indicates that the better the service quality, the higher level the customer satisfaction comes to in mobile

telecommunication industry. Meanwhile, price perception has a lowest positive impact on customer satisfaction in compared with two other factors (Coefficient Beta=0.232). However, researchers also have to consider this factor thanks to its significant contribution.

What's more, it is evident that customer satisfaction has a positive effect on customer loyalty with the most significant and highest level of influence (Coefficient Beta=0.692) in Vietnamese mobile telecommunication industry. Therefore, it is extremely important to enhance customer satisfaction if telecommunication companies want to increase customer loyalty.

### *Managerial implications*

First of all, from customer's perspective, brand image is the most important indicator in comparison to other factors (service quality and price perception) in creating customer satisfaction. Hence, it is extremely essential for managers to work out the marketing strategies on how to develop the image of mobile brand. In today's increasingly competitive mobile telecommunication market, marketing decisions related to development of brand image have to be paid much attention to, thus making mobile customers to be increasingly satisfied. Clearly, in mobile telecommunication industry, how to build up the brand image has been becoming a strategic focus in marketing management. Secondly, service quality also has a significantly positive effect on customer satisfaction as a second important factor. From management point of view, evidently, how to manage and improve the quality of mobile telecommunication services has been a strategic

role for marketers who want to enhance the customer satisfaction on the purpose of making more profit for mobile telecom service providers. Thirdly, although price perception is proved to be a third strong factor influencing on customer satisfaction in mobile telecom industry, management of mobile service providers should think more of its significant contribution to improvement of customer satisfaction. As a manager of mobile telecom company, he or she has to think strategically about how customer perceives the price. In addition, most importantly, the result of this study shows that customer satisfaction is strongly positively related to customer loyalty in mobile telecom industry. This has also been significantly supported by many findings in marketing literature. As far as marketing management is concerned, it is pivotal for mobile telecommunication managers to focus on customer satisfaction and customer loyalty when they plan and revise the marketing strategies. Customer satisfaction is a strategic focus in creating customer loyalty which can help mobile telecom service providers achieve the long-term financial goals.

#### *Limitations and further research direction*

It is undeniable that Structural Equation Modeling (SEM) is more applicable and practical in current research problems because

of some of its capabilities such as having more flexible assumptions, measurement error reduction, testing total model rather than individual coefficients in compared with Multiple Regression which performed analysis separately. However, this study used the method of Multiple Regression to test research model and hypotheses; and this should be mentioned as a research limitation. In future research, SEM should be applied as a popular data-analytic technique thanks to its practical advantages.

In addition, Ho Chi Minh city which is chosen to conduct this study is one of the biggest cities in Vietnam, and it may not represent for all customers in Vietnam. If research had conducted in other places instead of only Ho Chi Minh city, the samples might have been more representative. What's more, method of collecting samples in this study is non-probability sampling, especially convenience sampling. In further research, method of probability sampling can be used to improve the representative of sample. This study only investigates three factors (service quality, brand image and price perception) having impact on customer satisfaction and customer loyalty in mobile telecommunication industry, and it will be far more comprehensive if other factors is included in future research.

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