

*Full Length Research Paper*

# Environmental quality as an important dimension of customer satisfaction in apartment industry

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**This study aims to determine the dimensions of customer satisfaction. For this purpose, researchers developed a model by taking an experiential view. In this article, a standard questionnaire was used for collecting the data and, the authors report a comparative study that was conducted on two samples of real customers at apartment industry (low income and high income) in Iran. The results from a low income sample revealed that the customer satisfaction is influenced more by customer cost and product quality than other constructs. Moreover, the role of customer satisfaction as a mediating factor in the intention of word of mouth is supported. In contrary, in high income sample customer satisfaction influenced more by product quality and service quality than other constructs. In addition, the role of customer satisfaction as a mediating factor in the intention of word of mouth is rejected. A notable advantage of the model developed in this study is that, it covers essentially all the quality issues an apartment customer may encounter (that is, physical or product, service, and environment).**

**Key words:** Customer satisfaction, word of mouth, service quality, apartment industry, Iran.

## INTRODUCTION

Customer satisfaction significantly influences an organization's current and future performance (Lewin, 2009, 283; Gilbert and Veloutsou, 2006; Hansemark and Albinsson, 2004); it is a key issue for all those organizations that wish to create and keep a competitive advantage in this highly competitive world. Customer satisfaction is regarded as a primary determining factor of purchasing behavior (Burns and Neisner, 2006). Increased customer satisfaction generates positive word of mouth (WOM) and brings in new customers to the firm (Chakraborty et al., 2007; Babin et al., 2005; Aydin and Ozer, 2005). Moreover, improving customer satisfaction, which results in increased return intention and positive WOM endorsement, will in turn not only strengthen customer loyalty, but also generate greater revenue and

improve reputation of company (Kim et al., 2009).

The organization wants to know how satisfied their customers are in order to be translated into marketing strategy and organizational development. Because, it was important to understand the ways that product and services can influence customer behavior in terms of satisfaction (Fonseca, 2009).

Customer satisfaction in housing can have societal implications far beyond those of standard consumer product experiences. Housing satisfaction is an important component of overall life satisfaction. Also, housing satisfaction has long been a major research topic in such disciplines as sociology, psychology, planning, civil engineering, marketing and geography (Lu, 1999).

The housing problem in Iran has been intensifying since the 1980s. This has been brought about by the intense population growth. The rapid demand for apartment homes growth has made the need for adequate housing for the people a very important concern of the public or private sector of Iran, especially in the big

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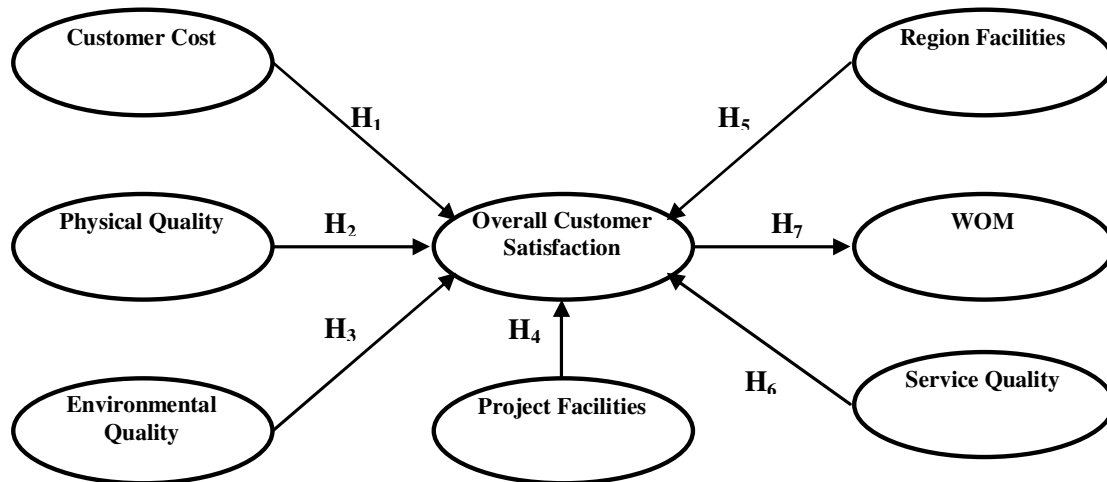


Figure 1. Hypothesized model of customer satisfaction.

cities. It has been a primary objective of the investors to provide decent housing to the citizen.

The massive growth of investment in apartment homes is forever altering the landscape of property investment. Within the Iran apartment industry, the rise of investment has created massive companies, in some cases building hundreds of apartment homes. Despite this unprecedented concentration, little investigation has been made into the effects of these developments on customer satisfaction. However, the rush to respond to these needs seems to result in a low quality housing that does not adequately match the needs of these people.

It has become increasingly important to evaluate customer satisfaction in apartment industry for many reasons. First of all, evaluating customer satisfaction provides the necessary information required for 'feedback' into current housing stock and 'feed-forward' into future projects. It provides the basis for taking decisions about improvements in current housing stock and about the design and development of future housing. Second, the idea that an evaluation of the performance of housing may be conducted makes housing managers, designers and policy makers more accountable (Amole, 2008). Third, Adequate housing is so much an integral part of the needs of every society that its value for individuals, families, communities, and society at large is hardly questioned (Opoku and Muhmin, 2009). Fourth, housing dissatisfaction can have direct impacts on physical and psychological health (James, 2009).

Because of the distinction between housing preferences of low-income and high-income consumers, this paper explored the housing preferences of low-income and high-income consumers in Iran, with specific emphasis on the factors influencing their housing satisfaction.

Previous studies on housing satisfaction has focused only on physical housing quality but, this research

presenting a model incorporating physical housing quality, service quality and environmental quality and relates these to consumer satisfaction and intention to engage in word of mouth activity. The model is then tested with two samples of high-income and low-income Iranian apartment consumers in major public housing schemes.

### Theoretical background and hypotheses

Figure 1 displays the hypothesized model explaining Iranian apartment customer's satisfaction and WOM. Based on a review of the literature, this study develop a framework linking customer cost, physical quality, environmental quality, service quality, project facilities, and region facilities to customer satisfaction.

Satisfaction is an overall customer attitude towards products, or is an emotional reaction to the difference between what customers anticipate and what they receive, regarding the fulfillment of some need, goal or desire (Hansemark and Albinsson, 2004). Furthermore, especially in the service field, customer satisfaction is typically defined as an overall assessment of the performance of various attributes that constitute a service (Fonseca, 2009).

Whether the buyer is satisfied after purchase depends on the offer's performance in relation to the buyer's expectations. In general, satisfaction is a person's feelings of pleasure or disappointment resulting from comparing a product's and service's perceived performance (or outcome) in relation to his or her expectations. If the performance falls short of expectations, the customer is dissatisfied. If the performance matches the expectations, the customer is satisfied. If the performance exceeds expectations, the customer is highly satisfied or delighted (Kotler and Keller, 2006).

Satisfaction also depends on product and service quality. What exactly is quality? Various experts have defined it as "fitness for use," "conformance to requirements," "freedom from variation," and so on. The study of Kotler and Keller (2006) showed that quality is the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs.

Improved service quality endows companies with social and commercial significance, and ensures greater customer satisfaction (Lu and Shock, 2008; Kotler, 2002). Moreover, high quality service contributes to a company's profits, customers costs, and encourages word-of-mouth recommendations to potential customers (Herstein and Gamliel, 2006).

Housing satisfaction refers to the degree of contentment experienced by an individual or family with regard to the current housing situation (Djebarni and Al-Abed, 2000). Determining the dimensions of customer satisfaction in apartment industry is less well studied.

Djebarni and Al-Abed (1998, 2000) assessed and compared residents' satisfaction with their housing and environment in the three housing schemes in Yemen. The principal variables of the model of Djebarni and Al-Abed (2000) are housing environment (the dwelling unit, neighborhood and community services) and housing quality (dwelling interior schedule, dwelling exterior schedule, and dwelling environment schedule). Interviews with occupants in the study of Djebarni and Al-Abed (2000) revealed that they attach great importance to the level of satisfaction with their neighborhoods. The most important factor associated with neighborhood satisfaction was privacy, a reflection of the cultural background in Yemeni society.

The study of Tsemberis et al. (2003) show that housing satisfaction was influenced not only by the quality of the home itself, but also by the surrounding neighborhood, patterns of social interaction, satisfaction with the management practice of repairs, and tenant involvement.

Phillips et al. (2005) examined the role of residential satisfaction (satisfaction with dwelling unit, estate and district) in mediating the effects of dwelling conditions (interior environment and exterior environment) on psychological well-being. Phillips et al. (2005) suggested that dwelling conditions can act as stressors and become contributing factors that impact on older persons' residential satisfaction and psychological well-being (subjective well-being).

Tu and Lin (2008) identified the internal evaluative structure with which Taipei City's residents assess the quality of their residential environment. Tu and Lin (2008) developed a multidimensional evaluative structure of residential environment quality, which consists of six evaluation scales (that is, urban planning and design, security and social relationship, transportation and commercial services, residential atmosphere, environmental health, and facility management) with eleven underlying

factors.

Amole (2009) studied the residential satisfaction in students' housing in Nigeria, and examined how satisfied students were and the factors which predicted residential satisfaction. Specifically, it examined whether the morphological configurations of the halls of residence would predict residential satisfaction. The study of Amole (2009) show that more than half (53%) of the respondents were dissatisfied with their residences and the variables which explained satisfaction were the social qualities of the residences, especially, the social densities; the kitchenette, bathroom and storage facilities and some demographic characteristics of the students.

Nahmens and Ikuma (2009) described an exploratory study that focused on customer satisfaction with service quality, and assessed the correlations between various factors on home buyer expectations and their perceptions of service quality.

Yau et al. (2009) used the Building Quality Index (BQI), developed by The University of Hong Kong, to assess the performance of the whole stock of buildings in Hong Kong. Building Quality Index indicated that architecture, building services, operations and maintenance, external environment, and management approaches are significant determinants of the building performance.

Opoku and Muhmin (2010) examined the housing preferences of low-income consumers in Saudi Arabia, with specific emphasis on their preferences for alternative dwelling types and tenure options, factors influencing their housing decisions, and how these vary across socio-demographic sub-segments of this population segment. Opoku and Muhmin (2010) find that majority of respondents prefer the small house to duplex or apartment, and despite their limited incomes the majority prefer buying over renting. On importance of housing attributes in Opoku and Muhmin's research, a factor analysis of 35 housing attributes included in the study produced 10 factors, of which financial considerations, private living space, and aesthetic aspects of the house rank as the top 3 important factors in the low-income consumers' housing decisions.

The results of the preceding studies have demonstrated, on the whole, effects of product, service, and environmental quality dimensions on overall customer satisfaction (Rosen and Suprenant, 1998; Johnson et al., 2001; Humburg and Giering, 2001; Lin, 2007; Tu and Lin, 2008; Lewin, 2009; Fonseca, 2009; Denge et al., 2009; Wu and Liang, 2009; Frank and Enkawa, 2009; Kim and Lee, 2010). Moreover, from the suggested relationships in the literature (Rosen and Suprenant, 1998; Johnson et al., 2001; Denge et al., 2009; Wu and Liang, 2009; Frank and Enkawa, 2009), customer cost is particularly important in customer satisfaction formation.

To assess the importance of other dimensions of customer satisfaction in apartment industry that were not addressed in the profiles described above, we presented

respondents with a list of housing-related factors and asked them to indicate how important each would be if they were making a decision purchase a house. The factors were obtained through an exploratory study utilizing a combination of literature review, depth interviews and focus group discussions. The depth interviews and focus group discussions were conducted by civil engineers and undergraduate students of a marketing research class taught by one of the authors. Consequently, the following hypotheses are proposed:

- H<sub>1</sub>: Customer cost has a significant positive direct effect on overall customer satisfaction.  
 H<sub>2</sub>: Physical quality has a significant positive direct effect on overall customer satisfaction.  
 H<sub>3</sub>: Environmental quality has a significant positive direct effect on overall customer satisfaction.  
 H<sub>4</sub>: Project facilities have a significant positive direct effect on overall customer satisfaction.  
 H<sub>5</sub>: Region facilities have a significant positive direct effect on overall customer satisfaction.  
 H<sub>6</sub>: Service quality has a significant positive direct effect on overall customer satisfaction.

One of the aspects of post-purchase behavior is WOM. WOM communication simply involves people sharing an assessment of their experiences (Kim et al., 2009). WOM is defined as the extent to which a customer informs friends, relatives and colleagues about an event that has created a certain level of satisfaction (Soderlund, 1998). According the work of Macintosh (2007), WOM communication can be defined as “informal communications directed at other consumers about the ownership, usage, or characteristics of particular goods and services and/or their sellers”. WOM is a social behavior involving person-to-person communication where the receiver perceives the giver to be non-commercial with regard to a service, product, or brand (Ferguson et al., 2010). Word of mouth is much more credible than your most sincere salesperson. It is able to reach more people and faster than advertising and direct mail because it can spread like wildfire (Procter and Richards, 2002). Information obtained through WOM is generally very credible and is relied on, particularly in the later stages of product or service evaluation and purchase (Swanson and Kelley, 2001). Evidence indicates that WOM is often related to consumers’ satisfaction or dissatisfaction with previous purchasing experiences (Mangold et al., 1999).

Kim et al. (2009) investigated the relative importance of institutional DINESERV factors (that is, food quality, atmosphere, service quality, convenience, and price and value) that affect customer satisfaction in the university dining facilities and to examine the influence of customer satisfaction on return intention and WOM endorsement. The study of Kim et al. (2009) showed that all Institutional DINESERV Dimensions had a significant positive effect on overall customer satisfaction and revisit intention.

Maxham (2001) examined the effects that different levels of service recovery have on satisfaction, purchase intentions, and one’s propensity to spread positive WOM. The results of Maxham’s (2001) study indicated that moderate to high service recovery efforts significantly increase post-failure levels of satisfaction, purchase intent, and positive WOM. Alternatively, poor service recoveries seemingly exacerbate the discontent attributed to a service failure.

Macintosh (2007) examined the potential links between customer orientation, expertise, and relationship quality at the interpersonal level and the link between relationship quality and positive service outcomes at the firm level, such as positive word of mouth. The results of Macintosh’s (2001) research showed significant links between relationship quality at the interpersonal level and positive outcomes at the organizational level. In addition, interpersonal relationship quality enhanced customer satisfaction with the service firm but was also directly linked to positive WOM about the firm.

Chaniotakis and Lympelopoulos (2009) studied the effect of service quality dimensions on satisfaction and WOM for maternities in Greece. The results of research of Chaniotakis and Lympelopoulos (2009) suggested that, in addition to “satisfaction”, the only service quality dimension that directly affects WOM, is “empathy”. In addition, “empathy” affects “responsiveness”, “assurance” and “tangibles” which in turn have only an indirect effect to WOM through “satisfaction”.

Kim and Lee (2010) examined the relative importance of perceived service quality and the relationship between perceived service quality, customer satisfaction and behavioral intention using multidimensional methods. The results of the study of Kim and Lee (2010) indicated that the significant dimensions of customer satisfaction are tangibles and responsiveness. In addition, the study confirms the significant consequences of customer satisfaction including WOM communication, purchase intentions, and complaining behavior.

Babin et al. (2005) studied the relations between hedonic value, utilitarian value, and customer satisfaction with WOM in restaurant industry. The research of Babin et al. (2005) showed that customer satisfaction has a significant positive direct effect on WOM.

Finally, the end result is a model offering an explanation of Iranian customer’s WOM. While WOM is a critically important factor in any culture, its importance may be amplified in cultures with relatively high communal orientations. Since Iran is considered among the most collectivist societies (Hofstede, 2003), we believe word-of-mouth communication plays a critical role in our model.

Iran’s lowest Hofstede ranking is Individuality (IDV) at 41 (Figure 2), compared to the Muslim countries average of 38. The low ranking on this Dimension indicates the society is Collectivist as compared to Individualist. This is manifest in a close long-term commitment to the member

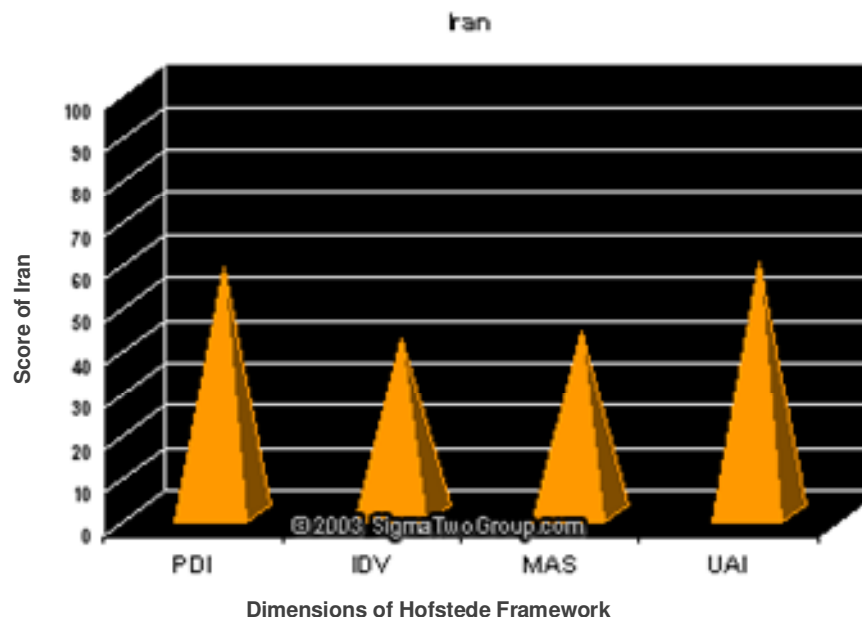


Figure 2. Ranking of Iran in Hofstede model.

'group', is that a family, extended family, or extended relationships. Loyalty in a collectivist culture is paramount, and over-rides most other societal rules and regulations. The society fosters strong relationships where everyone takes responsibility for fellow members of their group (Hofstede, 2003).

Hence, based on the above definitions and suggested relationships in the literature, the following hypothesis is formulated:

H<sub>7</sub>. Overall customer satisfaction has a significant positive direct effect on word of mouth.

## MATERIALS AND METHODS

The target population of this study was low income (that is, with monthly incomes less than 500000 Rials (US\$500) and high income (that is, with monthly incomes more than 500000 Rials) apartment buyers in Iran. This study collected data through a survey conducted in the major cities of Iran using a structured self administered questionnaire. The questionnaire addressed several housing related issues and respondents also provided socio demographic information.

Eleven male and nine female undergraduate students were trained for the data collection. 1200 apartment buyers of public projects in the major cities (project A:400, project B:200, project C:250 and project D:350) were selected through cluster sampling and were studied. A total of 931 usable questionnaires were collected. Of these 674 (72.4%) met the low income classification criterion and 257 (27.6%) met the high income classification.

## Measures

Eight constructs, physical quality, customer costs, environmental security, project situation, project facilities, word of mouth, service

quality, and customer satisfaction, were operational defined in order to test the research model. Customer satisfaction and WOM items were modified in English for cell phone and restaurant industries, and then translated into Persian. These instruments were reviewed by two Iranian experts to ensure that the Persian wording and content of items was appropriate. Other items (that is, physical quality, customer cost and etc) were generated via a series of focus groups.

## Overall customer satisfaction scale

A number of both national and international barometers have been introduced in the last decade. The development of national customer satisfaction barometers can be summarized in the following main efforts (Grigoroudis and Siskos, 2004; Johnson et al., 2001):

1. The first attempt to develop and install a national measure for customer satisfaction was reported in Sweden in 1989. Professor Claes Fornell was the main architect of the Swedish National Customer Satisfaction Barometer.
2. The national quality and satisfaction barometer of Germany (The German Customer Barometer—Quality and Satisfaction) focuses mainly on the micro-economical level of business organisations and it was established in 1992.
3. Professor Claes Fornell supervised the conduct of the preliminary analysis of the American Customer Satisfaction Index (ACSI) in 1993. This particular index constitutes an effort to adopt the Sweden satisfaction barometer in America, with some improvements, revisions, and reconciliation. The ACSI provides complete data since 1994.
4. It should be noted that the European Union is interested in the development and installation of a comparative system of national satisfaction indices since 1998. The preliminary study in a limited number of industry sectors was conducted within 1999, while results for the European Customer Satisfaction Index (ECSI) were published in 2000.
5. Other individual efforts of establishing national satisfaction indices in the European area concern Denmark, Austria, France,

**Table 1.** Service quality dimension definitions (modified from Zeithaml et al., 1990).

Service quality dimension	Original definition	Tailored definition for home building
Appearance	Visual impression of the service organization: facilities, equipment, and personnel.	Visual impression of the home builder: nice brochures, Well decorated sales office, sales personnel, etc.
Reliability	Consistency of performance and dependability.	Consistency of performance and dependability of the service before, during and after the home-buying process.
Timeliness	Timeliness of service.	Timeliness of the service before, during and after the Home buying process.
Knowledge	Possession of the required skills and knowledge to perform the Service, Ability to inspire trust and confidence.	Appropriate knowledge and skills required to perform the service before, during and after the home-buying process.
Empathy	Politeness, respect and friendliness of contact personnel. Individualized attention, making the effort to know customers and their needs.	Politeness, respect and friendliness of the sales personnel or any other builder's employee that directly interacts with the home buyers.

The Netherlands, Switzerland, and others.

6. Both Taiwan and New Zealand measure and report the customer satisfaction of a limited number of companies since 1995. Also, the preliminary survey for the installation of a permanent satisfaction barometer in South Korea was conducted in 1998, while in Malaysia, a pilot survey is planned for the next year.

In this study customer satisfaction was measured using a scale developed by Oliver and Swan (Burns and Neisner, 2006). Since the original items were developed for the automobile buying experience, it was necessary to modify the items to relate to apartment buying experience (Appendix). All eight items were measured using 5-point scales anchored by "Strongly disagree" (1) and "Strongly agree" (5).

### Service quality scale

Researchers have tried to develop conceptual models to explain the service quality and to measure consumers' perceived service quality in different industries (Seth et al., 2005). In the absence of objective measures for assessing service quality, Berry, Zeithaml, and Parasuraman developed a multiple-item scale instrument (SERVQUAL) for measuring customer perception of service quality. SERVQUAL is considered robust in different environments (Wong and Sohal, 2002; Nahmens and Ikuma, 2009; Oneill et al., 1998; Baumann et al., 2007).

In this research, the five SERVQUAL dimensions were modified and used to measure service quality (Table 1). The purpose of SERVQUAL is to measure current service quality with diagnostic abilities. It is not predictive. This assessment model was used in this study with some modifications to reflect the housing industry domain. This model (Table 1) defines service quality as the discrepancy between apartment buyer's service expectations and service experienced. Apartment buyer's service expectations are influenced by past experiences, communication (builder's advertisement, brochures, etc.) and personal needs. Service experienced is the actual service apartment buyers received from their builders during the entire process of sale through the warranty period.

This model also identifies five dimensions that apartment buyers use to assess service quality and represent the evaluative criteria of

the current study. To quantify the five dimensions of service quality in the home building context, it was necessary to tailor the original definitions and provide a simple, conceptually sound definition of each dimension of service quality within the home-building process (Table 1).

### Word of mouth scale

Word of mouth was measured using a scale developed by Babin, Lee, Kim, and Griffin (Babin et al., 2005). Word of mouth intentions (WOM) were assessed using three items. The items measured agreement using a 5-point Likert scale with statements concerning intentions to say positive things to others, recommend the apartments of project to another consumer, and encourage friends and relatives to buy the apartment from this project.

### Customer satisfaction dimensions scales

Phillips et al. (2005) suggested that assessment of dwelling conditions includes at least ten dwelling characteristics (such as lighting, levels of crowding and temperature) and ten neighborhood characteristics (such as lighting in corridor, lobby, public space, stairs, lift, escalator, air and noise pollution).

Residents' satisfaction in the model of Djebarni and Al-Abed (2000) measured by two variables (housing environment and housing quality). Housing environment items are dwelling unit (number of bedrooms, size, sunshine, and etc), neighborhood (neighbor, roads, lighting, and etc), and community services (drainage system, fire protection, and transportation). Housing quality items are dwelling interior schedule, dwelling exterior schedule, and dwelling environment schedule.

Based on the research of Tu and Lin (2008), environmental quality was measured by six variables. These variables are citywide housing status (dwelling types), residential density in typical residential zones (dwelling unit density, avenue floor area per dwelling unit, avenue floor area per person), mixed use intensity, and spatial features in typical residential zones (typical block size, building height, side walk, street scope).

The model of Nahmens and Ikuma (2009) identified five dimensions that homebuyers use to assess service quality. These dimensions are appearance (visual impression of the service

**Table 2.** Reliability and validity test.

Scales	Alpha	$\chi^2_{/df}$	NNFI	RMSEA	NFI
Customer cost	0.51	3	0.93	0.03	0.93
Product quality	0.83	2	0.90	0.02	0.89
Region facilities	0.62	2	0.91	0.01	0.95
Project facilities	0.67	3	0.89	0.04	0.97
Service quality	0.72	2	0.95	0.08	0.90
Environmental quality	0.86	2	0.92	0.02	0.92
Customer satisfaction	0.77	2	0.88	0.03	0.94
Word of mouth	0.80	3	0.90	0.02	0.89

organization: facilities, equipment and personnel), reliability (consistency of performance and dependability), timeliness (timeliness of service), knowledge (possession of the required skills and knowledge to perform the service, and ability to inspire trust and confidence), and empathy (politeness, respect and friendliness of contact personnel, individualized attention, making the effort to know customers and their needs).

Based on the study of Yau et al. (2009), a list of building factors that fit the institutional and cultural settings of apartment buildings in Hong Kong was identified for the development of the Building Quality Index (BQI). These factors are architecture (size, plan shape, headroom, windows, noise reduction, and open space), building services (water supply, drainage, refuse disposal, lift), external environment (density, adjacent use, air quality, aural quality, visual obstruction, thermal comfort), operations and maintenance (cleaning, pest control, refuse handling, drainage condition, unauthorized alteration, water quality), and management approaches (owners' duties, documentation, emergency preparedness).

Amole (2009) conceptualized residential satisfaction as influenced by objective and subjective measures of housing attributes and the demographic characteristics of the students. Objective physical variables include the morphological configuration of the hall, number of persons in the bedroom, presence or absence of reading room, common room, kitchenette and a balcony (terrace at the back of the bedroom). Subjective variables include attitudes about comfort, bedroom furnishing, number of persons in the bedroom, number of persons on the floor, privacy in bedroom, the sanitary facilities, number of persons using the sanitary facilities, the kitchenette in general, design of the hall, number of persons in the hall, location of the hall.

Numerous specific housing attributes and house purchase factors have been suggested by Opoku and Muhmin (2010) are: financial/economics, private living space, aesthetics, local environment, air quality, public living space, building design, proximity to relatives, outdoor space, and street location.

In this study, the scales of customer satisfaction dimensions were generated via a series of focus groups. Specifically, the focus group comprised teams of apartment customers in Iran. Focus group participants were instructed to formulate questions by using the dimensions suggested by past research (that is, Amole, 2008; Djebarni and Al-Abed, 1998; Ilozor, 2009, and etc). These questions are grouped under different dimensions (Appendix).

These dimensions are: "customer cost" (includes the price and credit), "physical quality" (includes the cracks, kitchen, lighting[electronic lighting and window to outside], water[ plumbing facilities, water quality and water pressure], drainage, commode, internal architecture), "environmental quality" (includes the traffic, noise and region security), "project facilities" (includes the parking, lobby, external staircase, lift, front and warehouse), "region facilities (includes the existence of park, primary school, at least 5 shops

and public transport within 1 kilometer radius of zone center )" . Each item was rated on a five-point Likert type scale ranging from strongly disagree (1) to strongly agree (5).

Preliminary versions of this questionnaire were then reviewed by project managers in well known building enterprises in Iran and were subsequently modified. The final revised version was then presented to apartment customers' experience with quality in the apartment industry.

## RESULTS

### Analysis of scale properties

Before assessing the research model it was necessary to establish the validity and reliability of the modified items and the new items developed for this study (Kang and James, 2004). Confirmatory factor analysis (CFA) was utilized to verify the construct validity of scales. In order to have a valid construct, the items comprising a construct must be one dimensional.

The psychometric properties of each construct were evaluated in separate confirmatory factor models using LISREL 8.5. The model fit for each CFA was evaluated using the Normal Fit Index (NFI), Non Normal Fit Index (NNFI), the Root Mean Square Error of Approximation (RMSEA) and  $\chi^2_{/df}$  values were also reported as references for model fit (Table 2).

The coefficient alphas were also reported to evaluate the reliability of each construct (Table 2). Notably, Nunnally and Bernstein suggested that 0.7 should be used as the cut off point for reliability with items that did not significantly contribute to the reliability (item to total coefficient alpha 0.5) being deleted for the purpose of parsimony (chang and chieng, 2006). The reported values show that, all scales are congener and reliable. Moreover, the latent constructs are inter-correlated.

### Structural model

The 44 measured items were constrained into eight construct, congeneric measurement model. Co-variances between these items were computed and used as input for confirmatory factor analysis (CFA).The results of the

**Table 3.** The results of structural equation model testing.

Low income customers		
Hypotheses	Standardized beta(t)	Hypotheses support
H <sub>1</sub> : customer cost to overall customer satisfaction	0.45(2.21)	Yes
H <sub>2</sub> : physical quality to overall customer satisfaction	0.22(0.86)	No
H <sub>3</sub> : environmental quality to overall customer satisfaction	0.48(2.25)	Yes
H <sub>4</sub> : project facilities to overall customer satisfaction	0.24(1.03)	No
H <sub>5</sub> : region facilities to overall customer satisfaction	0.14(0.67)	No
H <sub>6</sub> : service quality to overall customer satisfaction	0.74(3.05)	Yes
H <sub>7</sub> : overall customer satisfaction to word of mouth	0.91(5.65)	Yes
High income customers		
Hypotheses	Standardized beta(t)	Hypotheses support
H <sub>1</sub> : customer cost to overall customer satisfaction	0.02(0.26)	No
H <sub>2</sub> : physical quality to overall customer satisfaction	0.32(4.11)	Yes
H <sub>3</sub> : environmental quality to overall customer satisfaction	0.13(1.96)	Yes
H <sub>4</sub> : project facilities to overall customer satisfaction	0.21(3.00)	Yes
H <sub>5</sub> : region facilities to overall customer satisfaction	- 0.09(- 1.45)	No
H <sub>6</sub> : service quality to overall customer satisfaction	0.47(7.30)	Yes
H <sub>7</sub> : overall customer satisfaction to word of mouth	0.00(0.02)	No

Significant  $p \leq 0.05$ .

LISREL estimation of the structural model are summarized and reported in Tables 3 and 4. The research model was tested using a structural equation modeling approach. LISREL 8.52 was used to estimate the parameters and assess the fit of the model. The LISREL methodology development started in 1970, when Karl Joreskog presented a first LISREL model at a conference. The first generally available LISREL program was published in 1975. The name LISREL is an acronym for "Linear Structural Relations". The qualifier "linear" is restrictive for the current version of the LISREL program, but the name LISREL has become synonymous with "structural equation modeling" or SEM (Stephen and Mathilda, 2008):

**Model 1 (Low income customers segment):** According to results, customer cost has a positive effect (H<sub>1</sub>:  $\gamma_1 = 0.45$  and  $T_{\text{value}} = 2.21$ ) on customer satisfaction (H<sub>1</sub> is confirmed), and physical quality has not a considerable positive effect (H<sub>2</sub>:  $\gamma_2 = 0.22$  and  $T_{\text{value}} = 0.86$ ) on customer satisfaction (H<sub>2</sub> is not confirmed).

The path coefficients depicted in Table 3 show that environmental quality are related positively to customer satisfaction (H<sub>3</sub>:  $\gamma_3 = 0.48$  and  $T_{\text{value}} = 2.25$ ), and project facilities has not a considerable positive effect (H<sub>4</sub>:  $\gamma_4 = 0.24$  and  $T_{\text{value}} = 1.03$ ) on customer satisfaction, therefore H<sub>3</sub> is confirmed and H<sub>4</sub> is rejected. In addition, region facilities has not a considerable positive effect (H<sub>5</sub>:  $\gamma_5 = 0.14$  and  $T_{\text{value}} = 0.67$ ) on customer satisfaction, but service quality has strong positive effect (H<sub>6</sub>:  $\gamma_6 = 0.74$  and  $T_{\text{value}} = 3.05$ ) on customer satisfaction. Consequently, H<sub>6</sub> is rejected and H<sub>5</sub> is supported.

There was also a positive relationship between overall customer satisfaction and word of mouth (H<sub>7</sub>:  $\beta_1 = 0.91$  and  $T_{\text{value}} = 5.65$ ); thus, H<sub>7</sub> is supported.

Goodness of fit statistics summarized in Table 4. These statistics, indicating the overall acceptability of the structural model analyzed. A large class of omnibus tests exists for assessing how well the model matches the observed data. The model fit was evaluated using NFI, NNFI, RMSEA,  $\chi^2_{/df}$ , and the chi-square values (Albright and Park, 2008).

**Model 2 (Low income customers segment):** Inspection of coefficients indicates (Table 3) that, as expected, customer cost has not a considerable positive effect (H<sub>1</sub>:  $\gamma_1 = 0.02$  and  $T_{\text{value}} = 0.26$ ) on customer satisfaction, but physical quality has strong positive effect (H<sub>2</sub>:  $\gamma_2 = 0.32$  and  $T_{\text{value}} = 4.11$ ) on customer satisfaction. Consequently, H<sub>1</sub> is rejected and H<sub>2</sub> is supported. Moreover, both environmental quality (H<sub>3</sub>:  $\gamma_3 = 0.13$  and  $T_{\text{value}} = 1.96$ ) and project facilities (H<sub>4</sub>:  $\gamma_4 = 0.21$  and  $T_{\text{value}} = 3.00$ ) have significant positive impact on overall customer satisfaction; thus, confirming H<sub>3</sub> and H<sub>4</sub>.

According to results, region facilities has a negative effect (H<sub>5</sub>:  $\gamma_5 = - 0.09$  and  $T_{\text{value}} = - 1.45$ ) on customer satisfaction (H<sub>5</sub> is rejected), and service quality has a considerable positive effect (H<sub>6</sub>:  $\gamma_6 = 0.47$  and  $T_{\text{value}} = 7.30$ ) on customer satisfaction (H<sub>6</sub> is confirmed). Finally, overall customer satisfaction is not related positively to WOM (H<sub>7</sub>:  $\beta_1 = 0.00$  and  $T_{\text{value}} = 0.02$ ). Hence, H<sub>7</sub> is supported.

Goodness-of-fit statistics summarized in Table 4. These statistics, indicating the overall acceptability of the



**Table 4.** Goodness of fit statistics.

Low income customers		High income customers	
NFI	0.92	NFI	0.90
NNFI	0.94	NNFI	0.89
RMSEA	0.03	RMSEA	0.02
$\chi^2/df$	3	$\chi^2/df$	3

structural model analyzed.

## DISCUSSION

Consumer satisfaction and WOM are important marketing outcomes affecting the profitability of the enterprise. Based on the findings from previous empirical studies (Lu, 1999; Djebarni and Al-Abed, 1998; Tsemberis et al., 2003; Phillips et al., 2005), a statistical approach to building housing customer satisfaction assessment is proposed in this paper. The current study analyzed the data collected from two different segment of apartment market in Iran and the following results emerged from the study:

**Low income market segment:** in this segment, the main factors effective on satisfaction of customer include the environmental quality, services quality and customer cost. Our results suggest that firms should focus not only on providing service quality, but they should also make sure that the environmental quality dimensions (e.g. traffic, noise and region security) and customer cost dimensions (e.g. price and credit conditions) provide high levels of customer satisfaction.

As two factors of service quality and customer cost simultaneously influence on customer satisfaction, so the marketers of this field, should have proper market researches and add those characteristics to their services (e.g. appearance, reliability, timeliness, knowledge and empathy) which are acceptable for the customers and in other words, they are ready to pay the extra expenses of it.

It should be mentioned that a high percentage of apartment buyers in Iran belong to this income group and competition in this section to takeover the market is very high. So, companies invest on different dimensions of service quality and customer costs and can satisfy low-income customers and obtain a good share in this great market.

Between low income customers, satisfaction of customer has a direct and significant effect on word of mouth and companies can use this method to establish relations with customers to make their cost effective instead of investing on other methods of promotion.

**High income market segment:** in this segment, other main effective factors on customer satisfaction include

product quality, services quality and project facilities. As customer cost do not have much effect on customer satisfaction in the segment, the marketer can add different characteristics to the product to make it distinctive.

Thus, it could be recommended that builders apply particular focus on their efforts to assure high product quality, service quality, and project facilities on those product dimensions (that is, cracks, kitchen, lighting, water, drainage, commode, internal architecture), project facility dimensions (that is, parking, lobby, external staircase, lift, front attractiveness and quality, warehouse), and service quality dimensions that are most important for each home buyer in order to be more effective in improving satisfaction. Yet this does not imply that the other dimensions be neglected as it was shown that home-buyer overall satisfaction is driven by all dimensions of product quality, service quality, and project facilities.

Although a small number of customers in this industry belong to this income group, a small number of investing companies can satisfy the satisfaction of customers and obtain a suitable share in this small but profitable segment of market through concentrating on different dimensions of the above-mentioned elements.

Customer satisfaction has not strong effect on word of mouth in this income group and other promotional method should be used to establish relations with customers.

In addition, future research should examine factors related to the limitations of the current study. First, more rigorous and detailed testing of measurement scales in Iran would further our knowledge of cross-cultural measurement issues. It is possible that some scales developed in Western culture (e.g. service quality measure) may not be suitable for the Iran culture. Second, and related, our results do not directly address cross-cultural differences between Iranian consumers and Western consumers. Researchers considering potential differences in core cultural values in greater detail may lead to specific hypotheses testing the moderating effect of culture on the relationships presented here. This research would require matching data from multiple cultures.

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## **APPENDIX**

### **Overall customer satisfaction**

1. The services have not worked out as well as I thought it would.
2. I am satisfied with my decision to use this apartment.
3. Sometimes I have mixed feelings about keeping it.
4. My choice to use this apartment was a wise one.
5. If I could do it over again, I'd choose a different company.
6. I feel bad about my decision to use this apartment.
7. I am not happy that I used this apartment.
8. Using this apartment has been a good experience.

### **Word of mouth**

1. Intentions to say positive things to others
2. Recommend the apartments of project to another consumer
3. Encourage friends and relatives to buy the apartment from this project.

### **Customer cost**

1. Price
2. Credit

### **Physical quality**

1. Cracks
2. Kitchen
3. Lighting [electronic lighting and window to outside]
4. Water [plumbing facilities, water quality and water pressure]
5. Drainage
6. Commode
7. Internal architecture

### **Environmental quality**

1. Traffic
2. Noise
3. Region security

### **Project facilities**

1. Parking
2. Lobby
3. External staircase
4. Lift
5. Front attractiveness and quality
6. Warehouse

### **Region Facilities**

1. Existence of park
2. Primary school
3. At least 5 shops and public transport within 1 kilometer radius of zone center