



Assessing the Influence of Dwelling Prices Variables in AL Khobar City

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Abstract:

The limited studies on the estimation of different kinds of dwellings especially in Saudi Arabia is mainly due to the unavailability of secondary data. For these studies, researchers need to collect data from the field. The literature on housing indicates that an enormous number of variables influence the cost of dwellings, and collecting data on all dwelling variables, either directly from the field or by secondary means, is impossible. As a result, researchers always select some variables and ignore other important variables with greater value than what they select. Therefore, this study aimed at introducing the descriptive survey approach as a necessary step to determining the most important variables that influence the estimation of the cost of dwellings in order to achieve an effective model for pricing. Two objectives towards the achievement of the goal are: 1) to review the literature of dwelling prices in order to identify the most commonly studied variables that influence the cost of dwellings; and 2) to assess the identified variables by conducting five- point Likert scale structured interviews in Al Khobar City. Sixty variables were identified and assessed in the conduct of twenty two structured interviews with the representatives of the real estate firms in AlKhobar city. Finally, the study presented some recommendations and highlighted further research.

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1. Introduction

The dwelling market is directly influenced by the economic health and wealth of a country. A high demand for dwellings leads to growth in many other economic sectors. In general, the interest of real estate developers, banks, policy makers and the general public are markedly engaged by the prices of dwellings (Selim, 2009). Numerous studies have been conducted to identify the variables that have impact on the cost of dwellings because the purchase of a dwelling is considered both an investment as well as a consumer item (Chin & Chau, 2003); (Selim, 2009); (Shekarian & Fallahpour, 2013).

The dwelling market, unlike other goods on the market, is distinctive because no two dwellings are the same. Price estimation is the result of the interaction of different variables, such as physical goodness of the dwelling itself, the buyer, location, and neighborhood (McCord, Davis, Haran, McGreal, & McIlhatton, 2012); (Chin & Chau, 2003). A large amount of research, most of which was carried out on dwelling markets in the west, particularly, in the United States, Canada and Europe was done to evaluate the variables that influence dwelling prices. Only a few studies have been done in the East and Middle East, in such places as Hong Kong, Taiwan, Japan, (Chin & Chau, 2003) and Saudi Arabia (Al-Kadi & Al-Jarallah, 2007).

The dearth of studies that involve the practice of estimating the prices of dwellings especially in Saudi Arabia is mainly due to unavailability of secondary data, which need to be collected by the author(s) and/or the assistants from the field (Al-Kadi & Al-Jarallah, 2007). As mentioned previously, the literature shows that because of the number of variables that influence dwelling prices, collection of data on all these variables needed for estimating the price of dwellings becomes an impossible task. Therefore, this study aimed at creating a background for further research in the estimation of dwelling prices. Two objectives were decided on to achieve the goal of this study. They are: 1) to identify the most commonly studied variables that influence the price of dwelling by reviewing the literature of dwelling prices; and

2) to assess the identified variables by conducting five- point Likert scale structured-interviews in Al Khobar city.

2. *Al Khobar City*

Al Khobar is one of the largest cities on the Arabian Gulf. It is part of the greater Dammam area, also known as Metropolitan Dammam, which is the largest metropolitan area in the Eastern Province of Saudi Arabia. Along with Al Khobar, which is the second largest in Greater Dammam area, there are other two main cities namely: Dammam and Dhahran. Al Khobar is linked to its surrounding urban areas by a good network of roads. King Fahd bin Abdul Aziz Road connects Al Khobar to Dammam, and is linked to Dhahran by Prince Faisal bin Fahd and Prince Sultan bin Abdul Aziz Roads. Also, the Gulf Cooperation Council Road connects Al Khobar with the Kingdom of Bahrain (Abdellatif et al., 2013). The total land area of Al Khobar is around 13485 acres (5457ha). This area is classified under six land use types: residential and commercial (1239 ha), general services (556 ha), virgin land (1721ha), industrial (166ha) and roads (1776 ha) (Abdellatif, et al., 2013). According to the 2010 census Al Khobar has 587,965 residents (14%) of the total Eastern Region population. The 2010 census indicates that the total number of occupied housing units in Al Khobar is (96809)m in a variety of residential patterns that include residential neighborhoods with a norganic layout, neighborhoods with a grid layout orthogonal, newly-planned neighborhoods and closed residential complexes. The city's approved structure plan identifies twenty two neighborhoods. These neighborhoods are classified under five major districts, namely: North, West, and South Al Khobar, Rakah and Thoqbah (Figure 1 & 2).

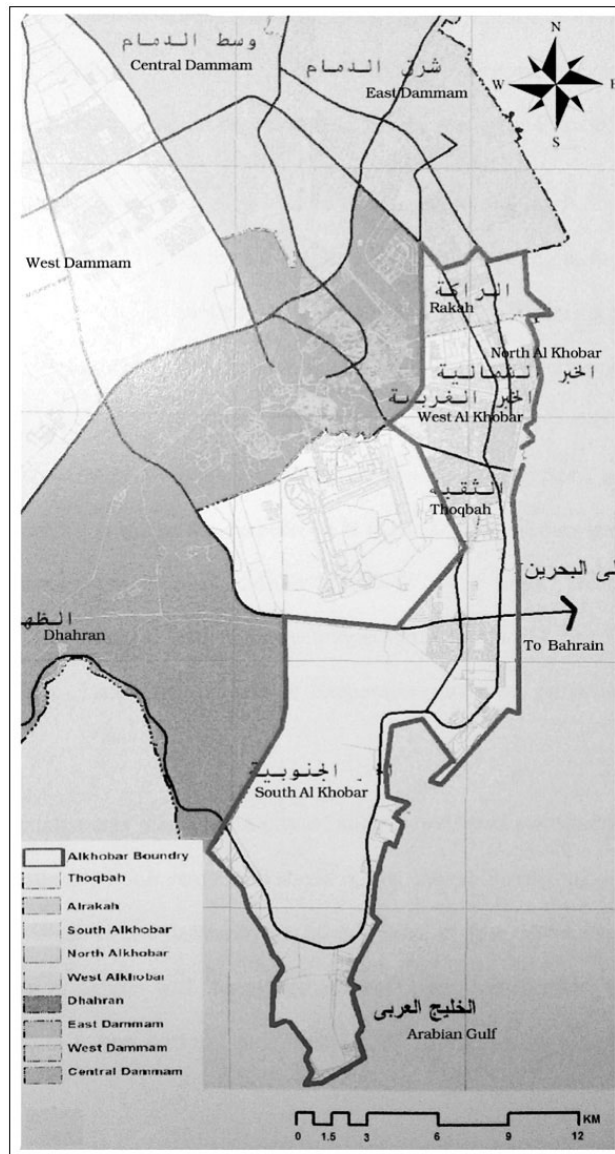


Figure (1) - AL Khobar City Boundaries
Source: (Al-Nuaim, 2013)

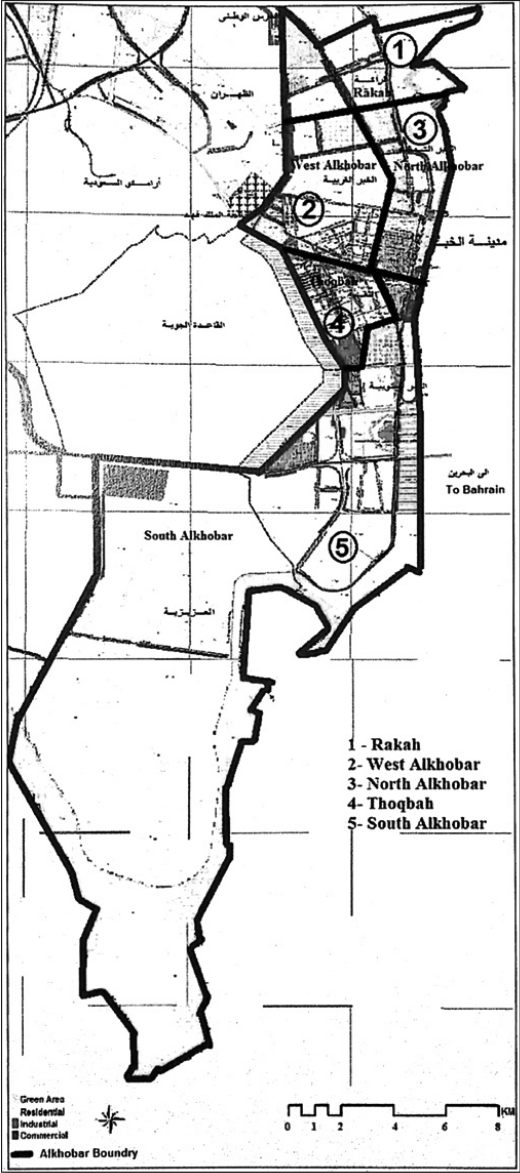


Figure (2) - AL Khobar City Existing Structure Plan
Source:(Al-Nuaim, 2013)

3. Literature Review

Three steps are required for an effective literature review process. These are inputs (gathering and screening the references), process (knowing, comprehending, applying, analyzing, synthesizing, and evaluating the references), and outputs (writing the literature review)(- Levy & Ellis, 2006). These steps are implemented in this study as demonstrated below:

- Inputs (gathering and screening the references):

The published articles, in both English and Arabic, which had references that directly or indirectly, discussed the variables that influence the estimation of the dwellings prices were gathered. Several computer databases used in the search included ABI Inform Global, Science Direct, Emerald and Springer. Several search terms such as House\ Dwelling\Home Variables and Prices Estimation\ Predication were used.

- Process (analyzing, synthesizing, and evaluating the references):

The gathered references were analyzed, synthesized and evaluated to clarify the determined variables that influence the estimation of the dwelling prices.

- Outputs (writing the literature review):

The final product of the literature review was a list of different categories of determined variables that influence the estimation of the dwelling prices.

3.1. Variables for Estimation of Dwelling Prices

A list of sixty variables Table (1) that affect the estimation of dwelling prices were identified and classified under five dimensions. In the literature of dwelling prices, these variables are recognized as the most determinate variables that influence the prices of dwellings.

3.1.1. Characteristics of Dwellings

Under this dimension, are several variables that reflect the physical characteristics of the dwelling such as the area, age, systems, room numbers and quality? These dwelling characteristics form the most important dimension to directly impact the cost of the transaction (Ball, 1973). However, the determinant variables of this

dimension are relatively different from one location to another, depending on the traditional style of the community and climate (Kohlhase, 1991). For example, in a hot humid climate, the type of the Air Conditioning (AC) system is a determinant variable for the price of the dwelling, while the Heating system is unimportant.

Of course, the age of the dwelling would negatively affect the price of the dwelling. Two main reasons can justify that: the need for maintenance and repair, and the difference in functional requirement between old and modern dwellings (Chin & Chau, 2003). Therefore, the age of dwelling is mentioned in several studies as a very important variable that directly affects the price of a dwelling (Fletcher, Mangan, & Raeburn, 2004);(Henderson & Song, 2008); (Jim & Chen, 2009).

The area covered by the dwelling also received a great deal of attention in the prediction of dwelling prices in the literature. Numerous studies have stated that the total floor area of a dwelling positively impacts the selling price of that dwelling (.McCord et al., 2012) (Bourassa, Hoesli, & Sun, 2006); (Brasington & Hite, 2008). Chin & Chau, (2003) stated that the most important reason for this is that buyers are willing to pay more for more space, especially functional space.

Services in buildings such as elevators, heating systems, AC systems, entrance also affect the dwelling prices, and their impact could be positive or negative depending on whether or not they are available (Selim, 2009); (McCord et al., 2012); (Shekarian & Fallahpour, 2013);(Wilhelmsson, 2008);(Al-Kadi & Al-Jarallah, 2007).

Lot size, swimming pool, and quality rating are mentioned in other researches as significant variables that influence the price of a dwelling(Goh, Costello, & Schwann, 2012; Kusan, Aytekin, & Özdemir, 2010; Mikelbank, 2005; Selim, 2009; Stevenson, 2004). For instance, Chin and Chau (2003) indicate that 6.9% is added to the cost of the dwelling if it has a single garage, and 20.7% added if there is a doublegarage.

Many studies in the literature indicate that materials used for the exterior of dwellings inevitably influence their prices. In these studies, several exterior materials mentioned are ferroconcrete, timber, bri-

quette, stone, brick, and mud brick (Bin, 2004; Gençay & Yang, 1996; Shekarian & Fallahpour, 2013).

3.1.2. Accessibility

Adair et al. (2000) and Hennenerry (1998) stated that the physical characteristics of the dwellings and their neighboring environment are acknowledged in the literature as the most important dimensions that influence the purchase price of a dwelling. Accessibility to transportation is the third most significant dimension in the decision to purchase. Traditionally, accessibility is measured on the level of ability to access the Central Business District (CBD). Access to transport, in general, describes the ease of travelling to and from amenities. Several methods used to calculate accessibility to transportation include traveling time, cost, convenience, and the availability of different modes of transport (Adair et al. 2000; Chin & Chau 2003). The importance of these modes of transport is different from one community to another. For instance, according to Chin & Chau (2003), traveling time is more critical than the cost of travelling because firms reimburse their employees for commuting.

Under this dimension, several variables identified in some studies are: proximity to a hospital (Chin & Chau, 2003), the central business district) (Bourassa et al., 2006); (Shekarian & Fallahpour, 2013); (Mikelbank, 2005); (Wooldridge, 1992); (Al-Kadi & Al-Jarallah, 2007), schools, (Meese & Wallace, 2003); (Al-Kadi, Al-Jarallah, & Duyffi, 2004), highways (Mikelbank, 2005); (Henderson & Song, 2008), public parks (Larsen & Blair, 2010); (Boyle & Kiel, 2001); (Al-Kadi et al., 2004), beaches (Jim & Chen, 2009).

3.1.3. Characteristics of the Neighborhood

In the literature on dwelling prices, the neighboring environment is classified as the second most important dimension after the physical characteristics of the dwelling (Adair, McGreal, Smyth, Cooper, & Ryley, 2000; Henneberry, 1998). Therefore, several studies have stated that an inappropriate modeling of neighborhood variables may cause substantial errors in the valuation of individual dwellings and the market in general (Chin & Chau, 2003). Classifications of the

neighborhood variables include landscape features, local government or municipal services, socio-economic variables, labor market characteristics and externals (Garrod & Willis, 1992); (Chin & Chau, 2003).

3.1.4. Characteristics of Households

The characteristics of households received some attention in the literature. Some identified characteristics of the households are annual income, age ((Brasington & Hite, 2008; Shekarian & Fallahpour, 2013), gender, marital status, family size in persons and annual expenditure, (Kestens, Thériault, & Rosiers, 2006; Shekarian & Fallahpour, 2013). Shekarian and Fallahpour (2013) stated that the age of the household and the size of the dwelling have the greatest effect on dwelling price in the area under their study.

3.1.5. Environmental Goods

Several environmental goods have received some good attention in the literature on dwelling prices. Such environmental goods include air quality, proximity to hazardous waste disposal site (toxic chemicals, radioactive materials, and biologic or infectious waste), number of hazardous waste disposal sites in the city and the distance to the nearest industrial area (Boyle & Kiel, 2001; Chin & Chau, 2003). Despite the importance of multiple environmental variables on the dwelling and neighborhood characteristics, only a few studies actually included multiple environmental variables in their models (Boyle & Kiel, 2001).

Table (1)
Variables effect the Dwellings Prices Estimation

Dimensions	Variables that Impact the Dwelling Price Estimation
Dwelling Characteristics	1. Age of the dwelling
	2. Floor Area of the dwelling
	3. Number of bedrooms
	4. Number of bathrooms
	5. Lot Size
	6. Number of balconies
	7. Presence balcony

Cont/ Table (1)
Variables effect the Dwellings Prices Estimation

Dimensions	Variables that Impact the Dwelling Price Estimation
Dwelling Characteristics	8. Presence of a garage
	9. Number of garage spaces
	10. Presence of elevator
	11. Floor height
	12. Presence of swimming pool
	13. The floor number on which the flat is located
	14. Quality rating
	15. Heating system type
	16. AC system type
	17. Kitchen area
	18. Kitchen type (open- independent)
	19. Living room area
	20. No garden
	21. Number of reception rooms
	22. Flat entrance privacy
	23. Number of flats in the building
	24. Main Orientation of the buildings
	25. Exterior materials type
	26. Floor materials types
Accessibility	1. Distance to the nearest hospital.
	2. Distance to the nearest public Park
	3. Distance to the CBD
	4. Distance to the nearest highway
	5. Distance to commercial sub center
	6. Distance to the railway station
	7. Distance to the nearest school
	8. Distance to the nearest beach
	9. Distance to the nearest bus terminal
	10. Distance to the nearest mosque
	11. Distance of the airport
	12. Distance to nearest high-rise office buildings

Cont/ Table (1)
Variables effect the Dwellings Prices Estimation

Dimensions	Variables that Impact the Dwelling Price Estimation
Neighborhood Characteristics	1. Crime rate
	2. The occupations of the inhabitants
	3. Fire protection
	4. Police protection
	5. The military sites
	6. Cemetery views
	7. The social class
	8. The annual income of the inhabitants
	9. The density of the people in the neighborhood
Households and Families Characteristics	1. Age of the household head in years
	2. Total education years of the household head in years
	3. Gender of the household head
	4. Marital status
	5. Family size in persons
	6. Annual expenditure of the household
	7. Annual income of the household
Environmental Goods	1. Distance to the hazardous waste disposal site (includes; toxic chemicals, radioactive materials, and biologic or infectious waste)
	2. Distance to the nearest industrial Area
	3. Number of hazardous waste disposal sites in the town
	4. Traffic noise impact
	5. Water quality
	6. Air quality

3.2. Methods and Procedures

The research methods included two main tasks, which were subdivided into phases and parts. The tasks and phases of the methodology led to fulfillment of the goal of the study.

1.1 Task one: Identifying the variables influencing the estimation of the dwelling prices

This task designed to fulfill the first objective of this study

involved several steps which are described in the section on literature review.

1.2. Task two: Developing a Structured-Interview Questionnaire

The structured-interview questionnaire for the real estate firms comprised two main sections. The first section was to collect general information about the participants. The second section required respondents to determine the influence of each of the identified variable on a five- point Likert scale. They were also asked to add any other variables not included in the structured-interviews questionnaire.

Phase 1: Conducting the Structured Interviews

Al Khobar city had been selected as the location for the conduct of the Structured Interviews. The target population of the study was all real estate firms registered in Khobar city. A list of them was obtained from the Chamber of Commerce in the Eastern province of Saudi Arabia. After determining the population size of real estate firms, the following equation (Kish, 1995) was used to calculate the sample size of the companies. Finally, they were selected randomly by random table.

$$No = (p * q) / v^2. \quad (1)$$

$$n = no / [1 + (no / N)] \quad (2)$$

Where:

No: First estimate of sample size.

p: The proportion of the characteristic being measured in the target population.

q: Completion of p or 1-p.

V: The maximum percentage of standard error allowed (10% for this study).

N: The population size.

n: The sample size.

Note: To maximize the sample, both p and q are each set at 0.5.

Phase 2: Analysis of the Structured-Interview Questionnaire

In this part, the results of the structured interview questionnaire

were statistically analyzed to calculate an importance index of the level of influence of the variable. For the calculation, the equation below (Dominowski, 1980) was used. Microsoft Excel was used to facilitate the process of applying this equation to all identified variables.

$$\text{Importance index } I = \frac{\sum_{i=0}^4 a_i x_i}{4 \sum x_i} \times 100\% \quad (3)$$

Where:

i = Response category index where $i = 0, 1, 2, 3, 4$.

a_i = Weight given to i response where $i = 0, 1, 2, 3, 4$.

x_i = variable expressing the frequency of i is as illustrated in the following:

x_0 = frequency of “Extreme Effect” response corresponding to $a_0 = 4$.

x_1 = frequency of “Strong Effect” response corresponding to $a_1 = 3$.

x_2 = frequency of “Moderate effect” response corresponding to $a_2 = 2$.

x_3 = frequency of “Slight Effect” response corresponding to $a_3 = 1$.

x_4 = frequency of “No Effect” response corresponding to $a_4 = 0$.

4. Analysis and Desiccation

The determination of the population size was based on data obtained from the Chamber of Commerce in the Eastern Province of Saudi Arabia. The data included a list of 233 real estate firms in Khobar registered in the Chamber of Commerce in the Eastern Province. By implementing equations (1) and (2), a total of 22 respondents was decided on as a sample size for the study. They were randomly selected using the random table. Based on the nature of the structured interview questionnaire, the analysis of the data obtained from the interviewees was divided into two parts. The first part was to collect general information from the interviewees as follows:

- As shown in Figure 1, 45 % of the interviewees had been working in the real estate business for more than 10 years. The results showed that about 27% of the interviewees had ten to twenty years of experience, 18% of those interviewed had more than twenty years experience, about 32% had five to ten years of experience and about 23 % had experience of less than 5 years.

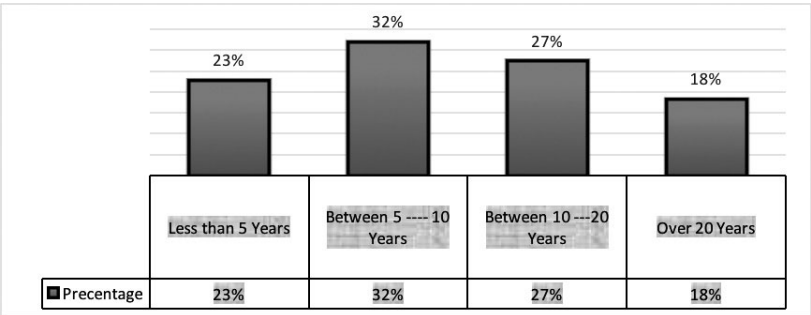


Figure (1) - Years of Experience of Interviewees

- As presented in Figure 2, 77 % of the interviewees worked as real estate salesmen, while about 23% owned the companies in which they worked.

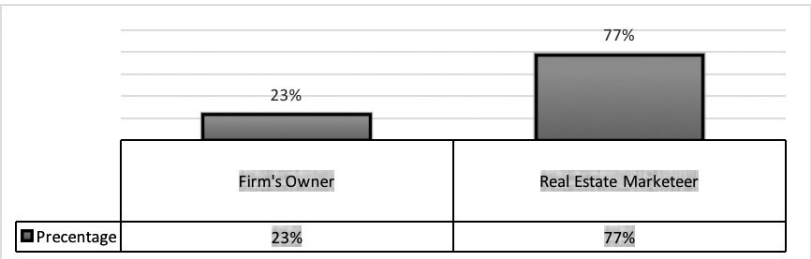


Figure (2) - Interviewee Positions in the Firm

In task two, the interviewees were asked to determine the effect of the identified variables by selecting one of five assessment terms, namely, “Extreme Effect (1)”, “Strong Effect (2)”, “Moderate effect (3)”, “Slight Effect(4)” and “No Effect(5)”.

The collected data was analyzed to calculate the index and rate of importance of each identified variable by applying equation 3.

To determine the degree of importance according to the respondents answers to the questionnaire, the following calibration was used:

The importance index of 0 - < 12.5% was categorized as No Effect; 12.5 - < 37.5% as Slight Effect, 37.5 - < 62.5% as Moderate effect, 62.5 - < 87.5% as Strong Effect, and 87.5 -100% as Extreme Effect.

Microsoft Excel was used to facilitate the process of applying the previous equation to all identified variables. Table (2) illustrates a summary of the assessed index values of the importance of variables and their rate of importance.

Table (2)
Variables Influencing Dwelling Prices Estimation
(Dwelling Characteristics & Dimension)

Dimensions	Variables that Impact the Dwellings Prices Estimation	Importance Index	Rate of Importance
Dwelling Characteristics	1. Age of the dwelling	87.5	Extreme Effect
	2. Floor Area of the dwelling	95.5	Extreme Effect
	3. Number of bedrooms	72.7	Strong Effect
	4. Number of bathrooms	73.9	Strong Effect
	5. Lot Size	95.5	Extreme Effect
	6. Number of balconies	2.3	Does Not Effect
	7. Presence of a balcony	2.3	Does Not Effect
	8. Presence of a garage	68.2	Strong Effect
	9. Number of garage spaces	59.1	Moderate Effect
	10. Presence of an elevator	73.9	Strong Effect
	11. Floor height	52.3	Moderate Effect
	12. Presence of a swimming pool	37.5	Moderate Effect
	13. The floor number on which the flat is located	69.3	Strong Effect
	14. Quality rating	92.0	Extreme Effect
	15. Heating system type	39.8	Moderate Effect
	16. AC system type	71.6	Strong Effect
	17. Kitchen area	68.2	Strong Effect
	18. Kitchen type (open- independent)	59.1	Strong Effect
	19. Living room area	61.4	Strong Effect
	20. No garden	64.8	Strong Effect
	21. Number of reception rooms	71.6	Strong Effect
	22. Flat entrance privacy	90.9	Extreme Effect
	23. Number of flats in the building	73.9	Strong Effect
	24. Main Orientation of the buildings	78.4	Strong Effect
	25. Exterior material type	95.5	Extreme Effect
	26. Floor material types	95.5	Extreme Effect

As shown in table (2), the variables of the goods of the dwellings were categorized into four groups, namely, "Extreme Effect", "Strong Effect", "Moderate Effect", and "No Effect". This finding was in conformity with previous studies, except as regards those variables categorized as "No Effect", such as the number of balconies if any, in the dwelling (Selim, 2009; McCord et al. 2012; Shekarian & Fallahpour 2013; Wilhelmsson 2008; Al Kadi & Al- Jarallah, Ahmed 2007; Mikelbank, 2005; keskin, 2008; Kusan et al, 2010). This finding can be interpreted as the result of two main factors: the harsh weather conditions and the customs and traditions of its citizens.

Table (3)
Variables Influencing Dwelling Price Estimation
(Accessibility Dimension)

Dimensions	Variables that Impact the Dwellings Prices Estimation	Importance Index	Rate of Importance
Accessibility	1. Distance to the nearest hospital.	46.6	Moderate Effect
	2. Distance to the nearest public Park	55.7	Moderate Effect
	3. Distance to the CBD	76.1	Strong Effect
	4. Distance to the nearest highway	72.7	Strong Effect
	5. Distance to commercial sub center	84.2	Strong Effect
	6. Distance to the railway station	0.0	No Effect
	7. Distance to the nearest school	58.0	Moderate Effect
	8. Distance to the nearest beach	45.5	Moderate Effect
	9. Distance to the nearest bus terminal	0.0	No Effect
	10. Distance to the nearest mosque	72.7	Strong Effect
	11. Distance to the airport	0.0	No Effect
	12. Distance to nearest high-rise office buildings	48.9	Moderate Effect

As shown in table (3), the variables in this dimension were categorized into three groups as follows: "Strong Effect", "Moderate Effect", and "No Effect". The results of this table were consistent with the findings of previous studies, except those variables categorized as "No Effect", namely, the distance to the railway station, bus terminals

and airports (Al-Kadi & Al-Jarallah, 2007; Al-Kadi et al., 2004; Jim & Chen, 2009; Larsen & Blair, 2010; Mikelbank, 2005; Shekarian & Fallahpour, 2013). This finding can be mainly explained by the absence of such variables, or variables that are not usually given any consideration by the buyers.

Table (4)
Variables Affecting the Dwelling Price Estimation
(Neighborhood Characteristic, Households and Families
Characteristics, and Environmental Goods)

Dimensions	Variables that Impact the Dwellings Prices Estimation	Importance Index	Rate of Importance
Neighborhood Characteristics	1. Crime rate	86.4	Strong Effect
	2. The occupations of the inhabitants	64.8	Strong Effect
	3. Fire protection	52.3	Moderate effect
	4. Police protection	52.3	Moderate effect
	5. The military sites	54.5	Moderate Effect
	6. Cemetery views	60.2	Moderate effect
	7. The social class	54.5	Moderate effect
	8. The annual income of the inhabitants	56.8	Moderate effect
	9. The density of the people in the neighborhood	70.5	Strong Effect
Households and Families Charac- teristics	1. Age of the household head in years	33.0	Slight Effect
	2. Total education years of the household head in years	23.9	Slight Effect
	3. Gender of the household head	21.6	Slight Effect
	4. Marital status	19.3	Slight Effect
	5. Family size in persons	19.3	Slight Effect
	6. Annual expenditure of the household	21.6	Slight Effect
	7. Annual income of the household	33.0	Slight Effect
Environmental Goods	1. Distance to hazardous waste disposal sites (includes; toxic chemicals, radioactive materials, and biologic or infectious waste)	52.3	Moderate effect
	2. Distance to the nearest industrial Area	55.7	Moderate effect
	3. Number of hazardous waste disposal sites in the town	53.4	Moderate effect
	4. Traffic noise impact	55.7	Moderate effect
	5. Water quality	51.3	Moderate effect
	6. Air quality	55.7	Moderate effect

In table (4), three dimensions are included, namely: Neighborhood Characteristics, Households and Families Characteristics and Environmental Goods, and their variables were put into three groups as follows: “Strong Effect”, “Moderate Effect”, and “Slight Effect”. In general, the overall findings shown in table 4 correspond in some measure to previous studies on estimations of dwelling prices (Adair et al., 2000; Boyle & Kiel, 2001; Brasington & Hite, 2008; Buonanno, Montolio, & Raya-Velchez, 2013; Chinloy, 1979; Chin & Chau, 2003; Clapp, Kim, & Gelfand, 2002; Henderson & Song, 2008; Keskin, 2008; Kestens et al., 2006; Ku'an et al., 2010; Larsen & Blair, 2010; Mikelbank, 2005; Rehm & Filippova, 2008; Shekarian & Fallahpour, 2013; Speyrer & Ragas, 1991; Wooldrige, 1992) with the exception of some variables on household characteristics, namely, the age of the head of the household in years and annual income of the household, which some authors recognized (Kestens et al., 2006; Shekarian & Fallahpour, 2013) as determinant variables of the estimation of the prices of dwellings.

5. Findings and Conclusions

The main findings of this study can be summarized as follows:

First, the study shows that all variables categorized as Strong Effect, and Extreme Effect are in complete agreement with suggestions made by previous studies that defined them as determinate variables. Therefore, these variables should be refined further to form the main bases for future studies that focus on dwelling prices modeling and sharpening them.

Second, the study further confirms all dwelling variable characteristics that were described in the literature as the most determinate in the estimation of dwelling prices. However, this study illustrates some of these as having No Effect. In other words, the interviewees believe that those variables were not important in estimating the prices of dwellings. These relate to whether there are balconies and how many there are in the dwelling. The type of dwelling was not important in the estimation process in this case. This finding may be the result of two main factors; the harshness of the weather in Al Khobar and the customs and traditions of its citizens.

Third, the study further indicates that some other variables were also classified as of No Effect, because they were absent, or were not usually taken into account by the buyers. These include distance to the railway stations, bus terminal and airports.

Fourth, several other variables including the following were added by interviewees:

- The existence of the power transformers in the boundaries of the plots.
- The distance to the nearest ICT (Information Communication Technology) antenna.
- The distance to high-tension cables.
- The distance to the nearest sewage treatment stations.
- The distance to the nearest gas station.

Fifth, although the findings of this research are directly related to the pricing of dwellings in the city of Al Khobar, they are potentially applicable to other cities that have the similar environmental and social characteristics.

Sixth, based on these findings, the following recommendation are being made:

- Those variables classified as having Extreme Effect, and Strong Effect are determinate in the city of Al Khobar and should be reckoned with in future studies.
- Those of Moderate Effect, and Slight Effect should be tested by real data collected directly from the field.
- Those variables added by the interviewees should be taken into account in any future modeling of estimations of dwelling prices.

In conclusion, this study shows that in studies on variables affecting the estimation of the prices of dwellings an assessment of the effects of the variables by structured interviews and any other techniques is an important method of determining the most crucial variables. This enables the achievement of effective modeling and sharpening of the variables., The results of this study, therefore, could form the basis of future research whose focus is on the modeling and sharpening of these variables.

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