Habitat International 50 (2015) 240–249

Contents lists available at ScienceDirect

Habitat International

journal homepage: www.elsevier.com/locate/habitatint

Housing valuation of different towns using the hedonic model: A case of Faisalabad city, Pakistan

Shabana [a], Ghaffar Ali [a, *], Muhammad Khalid Bashir [a], Hassan Ali [b]

[a] Institute of Agricultural and Resource Economics, Faculty of Social Sciences, University of Agriculture Faisalabad, University Road, Faisalabad, 38040, Pakistan

[b] Department of Rural Sociology, Faculty of Social Sciences, University of Agriculture Faisalabad, University Road, Faisalabad, 38040, Pakistan

ARTICLE INFO

Article history:
Received 15 May 2015
Received in revised form
24 August 2015
Accepted 26 August 2015
Available online xxx

Keywords:
Non-market valuation
Sustainable development
Housing valuation
Semi-log
Hedonic price model
Faisalabad

ABSTRACT

The present study was planned to determine housing valuation in Faisalabad city using hedonic approach and to estimate the association of determinants which may influence the value of houses in the selected urban communities of the city. To this end, 10 residential towns of Faisalabad city were selected to record data on a pre-designed questionnaire from randomly selected respondents (n = 20) from each town. Co-efficients of regression for the given data variables were calculated and subjected to the hedonic model. It was found that irrespective of the residential towns, people are willing to pay more for new houses, more covered area, lenter, kitchen, garage, lawn and drinking water supply ($R^2 > 0.9$; $P < 0.05$). Literacy rate, business and monthly income of the neighbours positively influenced the willingness of consumers to pay more for housing in the study towns ($R^2 > 0.9$; $P < 0.05$). Parks, sewerage system and solid waste management system are positively associated with the housing price ($R^2 > 0.9$; $P < 0.05$). However, preference of the industrial zone in Faisalabad city is not statistically associated with the price of houses ($R^2 < 0.5$; $P > 0.05$). The results of the study provided the first report on the hedonic modeling of housing system in the indigenous situation of Faisalabad which suggested different alternatives to the policy makers and house buyers of different socio-economic values in Faisalabad city. It is suggested that the characteristics positively associated with the housing valuation are required on urgent basis to the residents of Faisalabad.

1. Introduction

A measure of the benefit that an economic factor can gain from either a good or service is called as an 'economic value'. The process of determination of the economic value of any good or service is called 'valuation'. According to Geltner, MacGregor, and Schwann (2003), estimating the value of a property is called as "price discovery". The price discovery could be estimated using various primary methods viz; hedonic pricing, repeat sales and assessed value (Chen, Chang, Karacsonyi, & Zhang, 2014; Messe and Wallace, 1997). The three methods are primarily based on the regression analysis and co-efficient of regression; although, comparatively different from one another. The technique of price discovery is based on the objective of determining the possible relationship between the environmental variables and the price value of the marketed goods and services.

Housing is one of the basic needs of human being that not only provides shelter and calm but also a major form of individual wealth. There could be many reasons for justification of house valuation. For example changes in the price can: (a) affect the consumer's decision of spending or saving, (b) impact the estate business which is a rich source of employment, (c) change the basic factors which can affect the future supply and demand (Das, Senapati, & John, 2009). In the real estate markets, price adjustment plays a significant role in modulation of the house prices ignoring the basic fundamentals (Cho, Bowker, & Park, 2006; Plosser, 2007). In this context, measurement of an aggregate price valuation of houses becomes desirable in the society (Das et al., 2009). Different attributes e.g. air, water and pollution have been reported to have a direct impact on value of housing. To check people's willingness to pay for environmental quality, we can compare property's similar characteristics, examining the value of price and non-environmental factors.

The prices of similar houses constructed in different localities can vary depending upon variable factors. Valuation of goods based on their certain characteristics and consumer's choice is called as

* Corresponding author.
E-mail address: ghafar.gs@gmail.com (G. Ali).

http://dx.doi.org/10.1016/j.habitatint.2015.08.036
0197-3975/

hedonic pricing. So far, hedonic price indices have been estimated for automobiles (Griliches, 1961), computers (Dulberger, 1989) electronic goods, clothing's and housing (Bascher & Lacroix, 1999; Fixler, Fortuna, Greenlees, & Wlater, 1999; Hui, Zhong, & Yu, 2015; Okamoto & Sato, 2001; Pakes, 2001; Zhang, 2008) in different parts of the world. Likewise, few authors studied such characteristic in multiple settings such as (Crane, Daniere, & Harwood, 1997; Das et al., 2009; Doss & Taff, 1996; Fletcher, Gallimore, & Mangan, 2000; Griliches, 1961; Kim & Goldsmith, 2009; Lutzenhiser & Netusil, 2001; Özgüner & Kendle, 2006; Schipperijn et al., 2010; Shu, Zhang, Li, Qu, & Chen, 2014).

Hedonic model is a good choice to standardize the price valuation protocols for different commodities. However, in Pakistan, this model has not effectively been utilized. At present, the consumers/purchasers do not have any standard protocol or set of characteristics to estimate the price of a house in Pakistan. The hedonic model has successfully been implemented during the last decade for valuation of housing in different regions of the world including Sueol, Republic of South Korea (Jun, 2013); Africa (Chitonge and Mfune, 2015); Hangzhou, China (Wen, Zhang, & Zhang, 2014); California, USA (Mueller and Lommis, 2014); Lagos, Nigeria (Aliu & Ajala, 2014); Wales, UK (Tu et al., 2014) and Italy (Zoppi, Argiolas, & Lai, 2015). As far as could be ascertained, there is only single study which has recently been published by Rafiq (2011) in which valuation of the job risk has been determined using the hedonic price model. It is hypothesized that the value of a house built in a well-planned residential town away from a polluted environment is higher than that of a similar kind of house built next to power looms and/or in a polluted factory area of Faisalabad city. At present, the consumers/purchasers don't have any standard protocol or set of characteristics to estimate the price of a house in Pakistan. In this perspective, there is a dire need to standardize the house valuation protocol in the urban community of Pakistan. Hence, the present study was planned to investigate the housing valuation of different towns of urban area of Faisalabad using the Hedonic Price method.

This paper is organized into six main sections. Section 1 which includes the introduction is followed by Section 2 which explains the material and methods, the study area, and data collection, and Hedonic Price method used. Section 3 illustrates the results and Section 4 discussion in details, while the conclusion is contained by Section 5. Section 6 explains the acknowledgement.

2. Materials and methods

2.1. Study sites

Ten towns of Faisalabad city viz; (a) Lasani Gardens, Ismail Road, (b) Sarfraz Colony, Qaim Sain Road, (c) Ghulam Muhammad Abad, (d) Gulberg Town, (e) Gulfishan Colony, Jhang Road, (f) People's Colony No. 2, (g) Medina Town, (h) Amin Town, Canal Road, (i) Muslim Town, Sargodha Road, and (j) the City Center (Clock Tower) were selected for this study. The criteria of selection of these towns was: (a) at least 0.5 km away from the other selected town, (b) representing different socio-economic residents, (c) belonging to different environment, (d) having representation of all ages of houses, and (e) having apparently different market values of houses. The selection criterion was based on the wide disparity and geographical distance among the study towns. The study sites are given in Fig. 1.

2.2. Characteristic variables

The study was conducted in close accordance with the objectives. Particular attention was paid to objectively verifiable indicators depending on the level of truthful, quantitative and numerical information obtainable, and the extent to which it was possible to quantify and extrapolate conclusion from field investigation and observation.

2.3. Questionnaire development

In order to collect the pre-requisite information mentioned in the section results, a questionnaire was designed using dichotomous and closed ended options to record the information from the study sites. The information was carefully recorded using quantitative variables and dummy variables.

2.4. Data collection

Map grid method was used to conveniently select 10 respondents from each of the towns as reported earlier by Escobar et al. (2012). Briefly, the physical map of each town was divided into appropriate X and Y axis grids. The house samples were selected in a way to equally distribute the number of houses in each grid. The purpose of map grids was to distribute houses widely within the town to represent all areas of each town in an effective manner. The selected houses were observed and requisite information was inquired in local language for better understanding. The collected information was recorded in the pre-designed questionnaire in English language and was transferred to the computer for further analysis.

2.5. The hedonic modeling

Data collected were arranged in the excel sheet in terms of dependent and independent variables. The co-efficient of regressions of each of the characteristics will be calculated by application of regression analysis. The values were entered into the model mentioned described by Coulson (2014) with few modifications for calculation of any association of the listed characteristics with the valuation of houses in the selected towns. Modifications of the similar model have also been used by Mayor, Seán, David, and Richard (2009). In this particular case; our equation for the semi-log form of the hedonic model was as follows:

$$\ln[P] = a_o + a_1X_1 + a_2X_2 + a_3X_3 + a_4X_4 + a_5X_5 + \ldots\ldots + a_iX_i + E$$

where: ln[P] = Natural log of the predicted sale price of the houses in Pakistani rupees; a_o = Intercept (constant) for each town; $a_1 - a_i$ = co-efficients of the study variables; $X_1 - X_i$ = Study variable 1 thru I; E = Error term

The corrected equation was:

Natural log of the predicted sale price of house = Intercept + co-efficient of structural variable + co-efficient of neighborhood + co-efficient of distance variables + co-efficient of market variables + co-efficient of environmental variables + Error Term.

2.6. Statistical analysis and interpretation of the data

All data were analysed using Statistical Package for Social Sciences (SPSS; Version 20.1). One way Analysis of Variance (ANOVA) and F-test was applied on data of each town to calculate the level of significance (P). The value of P less than or equal to 0.05 was considered statistically significant and more than 0.05 was considered statistically non-significant. Simple linear regression analysis was conducted by taking the predicted sale