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DETERMINANTS OF RESIDENT HOUSE PRICE PERCEPTION; AN EMPIRICAL EVIDENCE FROM PAKISTAN

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ABSTRACT

This research aims to identify the determinants of resident house price perception by investigating the impact of physical quality, concept, and location factors in the context of twin' cities Rawalpindi and Islamabad. The data sample contains 100 questionnaires from residents in different towns of Rawalpindi and Islamabad. To investigate the relationship, the study has employed various statistical techniques like descriptive statistics, correlation analysis, Cronbach's alpha, and regression analyses. The results found in the analyses stated that location and financial condition factors, and changing of location from Rawalpindi to Islamabad have a significant positive association with resident house price perception of 05 Marla houses, location and financial condition factors have a significant positive association with resident house price perception of 10 Marla houses, and location factor and changing of location from Rawalpindi to Islamabad have a significant positive association with resident house price perception of 01 Kanal houses. The study did not find any significant association between physical quality factor, concept factor, brand developer factor, and resident house price perceptions.

Keywords: Environmental factors of house price perception, House price perception, and Pakistani real estate market

INTRODUCTION

Some literature exists about different types of factors and attributes that contribute to resident house price perception in different ways in developed and developing economies. Fluctuation in these prices is one important issue that can influence the economy of any country in different ways. There are various physical, behavioral, and macroeconomic factors discussed in past research that can influence real estate and resident house prices in different economies of the world.

The high population rate of Pakistan creates a housing problem and this problem opens opportunities for real estate developers and builders to earn a high rate of return on housing prices and real estate with its rising value with a passage of time. Ngoc, Tien & Hieu (2023) reported that physical features, location, and position, surrounding environment, and quality of management and maintenance services have a positive and significant impact on selling prices in the real estate market in Vietnam. Shafique, Ahmed, Kashif & Shah (2020) stated that structural attributes, covered areas, new houses, and the number of bedrooms, number of schools, and number of parks have a significant impact on housing prices. According to Rahadi et al., (2015) argued that a higher rate of population and limited supply has increased the housing prices pointedly in Indonesia. They further reported that lack of government policies and control, the real estate prices is rising uncontrollably. Real estate

products are unique and it is not easy to assign a specific price tag to the real estate product (Harshman and Quigley, 1991 and Hai zhen et al, 2005). Rahadi et al., (2015) reported that real estate builders and developers only base on their past level of experience to set real estate product prices, and it creates problematic and imbalance situations for real estate consumers because the price is subjective and real estate developers exclusively controlled the prices in a market.

Real estate price fluctuation is a very immense issue prevails in any country's economy. The recent global financial 2007-2008 occurred due to a high increase in housing prices in America. There can be various factors that lead to the fluctuation of the resident house prices in any specific region. Rahadi et al., (2015) reported that the first attribute to be noticed by the consumers is physical qualities when buying a house. Physical qualities factors are also studied by other researchers like Hofman et al, (2006), Akalin et al, (2009) and Riccardo et al, (2010). The infrastructure conditions, façade, physical qualities of a roof, road width, design of the building, and other specifications of product are mainly influencing their level of perceptions towards whether the current price of the specific house is suitable or not. The second perspective is the developed concept which also significantly swaying the decision of consumers to buy a housing product. Rahadi et al, (2015) reported that the main focuses of development in Jakarta region are green concepts, stress relieving and healthy, and appropriate for raising a family. The development and importance of the green concept were further studied by some researchers such as Blakely and Snyder (1997 a, 1997 b) and Spetic et al, (2005). The third main factor, that influences consumer decision about purchasing house products is location and accessibility factor. The importance of location factors regarding considering in consumer product buying decisions was also studied by Molin and Timmermans (2003). So many other factors can influence the decision of consumers to buying a house but the study particularly considers the factors that have used in the studies of Rahadi et al, (2012 and 2013) and Rahadi et al, (2015). Rahadi *et al.*, (2013) and Rahadi *et al.*, (2015) developed a group of three environmental factors for questionnaire development, physical qualities factor, concepts factor, and location factor. The Graph theory proposed by Leonhard Euler (1736) stated that graphs can be used to model different types of processes and relationships in physical, biological, and social information system. It states that many factors influence one main system. In the view of graph theory, the study connects environmental factors that influence resident house price perception.

Rahadi et al., (2015) reported that these factors should be explored in other regions to measure the validity and reliability of the relationship found in their research. The study aims to achieve the following objectives; (i) To find out the important factors that influence resident house price perception (ii) To investigate the relationship between physical quality, concept, and location factors and resident house price perception (iii) To examine the impact of financial condition and brand developer factors on resident house price perception and (iv) To explore the significant difference in resident house prices perception in Rawalpindi and Islamabad.

The study is crucial for real estate developers and consumers because there are very limited studies conducted in this sector in Pakistan. The findings of this research have been beneficial for real estate developers as behaviors of most of the consumers are similar in buying real estate products in other cities of the country. The general significance is that findings can be beneficial for real estate builders and developers, real estate consumers, government institutions, and for future researchers in the real estate sector.

The study has been identified the relevant factors that influence the resident house prices perception in Rawalpindi and Islamabad. It further contributed value to the existence research works and literature by investigating the relationship between environmental factors and resident house price perception in the twin cities of Rawalpindi and Islamabad and argued that location and financial condition factors, and changing of location from Rawalpindi to Islamabad have a significant positive association with resident house price perception of 05 Marla houses, location, and financial condition factors have a significant positive association with resident house price perception of 10 Marla houses and location factor and changing of location from Rawalpindi to Islamabad have a significant positive association with resident house price perception of 01 Kanal houses.

The study can be helpful for financial analysts, business developers, and real estate market players to

consider the important factors that influence resident house price perceptions and avoid bubbles in resident house prices in the context of Pakistan. Further government institutions and policy decision makers need to establish a stable real estate financial market and evaluate the resident house prices by considering the important factors. The study can further help students and researchers in their theoretical and empirical research in the real estate sector of Pakistan.

The paper is organized in the following sections; 01 section describes the introduction of research and study objectives, 02 section contains a literature review of previous studies, 03 section states data and research methodology, 04 section reports results and discussions and 05 section reports final conclusions and policy implication of the paper.

Literature Review

There is very limited research literature review available about real estate in the context of Pakistan. Currently, the real estate market of Pakistan is in the developing phase and has not yet developed properly. The real estate market is one of the important factors that can significantly contribute in the economic growth of any country. However, the global financial 2007-2008 crisis occurred due to high fluctuation and increase in real estate prices in America. Resident house price fluctuation is a very big issue in the Pakistani real estate market. There are some researches conducted globally which explored and identified various factors that can fluctuate resident house prices in any economy. Shafique, Ahmed, Kashif & Shah (2020) stated that structural attributes, covered areas, new houses, and the number of bedrooms have a significant impact on housing prices.

Blakely and Snyder (1997a, 1997b) reported that people select gated communities because of their preferences on security, prestige and lifestyle. Gribler and Nelson (1988) examined the application of consumer behavior to real estate prices and categorized consumer behavior motivation into internal and external determinants for consumers when purchasing real estate products. They included perception, motivation, attitudes, knowledge, personality, lifestyle, self-respect, and learning as internal determinant factors while family, social class, culture, subculture, and reference groups were included as external determinant factors. Riccardo et al. (2010) investigated the association between consumers' willingness to pay a higher amount of house rent for better-faced design of the house. Deng et al. (2009) investigated the factors that bring variation in housing prices in China by taking a sample size from 2000 to 2005 and concluded that the basic factors that bring variations in housing prices do not come from external market conditions, but major variations come in house prices due to change in level of household disposable income. Some other factors that can influence consumer buying decisions regarding house products and investigated in past research studies include land price, unemployment rate, housing units being sold, and new supply for housing buildings. Rahadi et al., (2012) investigated the factors that influence housing prices perceived from the resident consumer point of view and real estate developer point of view and suggested that on the basis of these point of view, there are four major determinants that influence resident house product prices. These determinants are accessibility, facilities, developer brand reputation and design. They further concluded that from a resident consumer perspective, three major determinants influence resident house prices; gated concept or planned community, reputation or prestige and security. Rahadi et al. (2013) further investigated and identified six major determinants that influence resident house prices are reshaped as physical qualities factor, development concept, location factor, real estate developer brand, financial condition of consumers, and lifestyle. The physical qualities factor is the prime determinant that can be considered by consumers when they buy a house. The elements of this factor studied by other scholars like Akalin et al. 2009), Riccardo et al. (2010) and Hofman et al. (2010). The elements of this factor includes infrastructure condition, roads width near to the house, façade, physical qualities of a roof, design of house building, and other specifications of the house product. These elements of physical quality factor influence their perception of whether the current specific house price is suitable or not. Rahadi et al. (2013) investigated past research studies and grouped the environmental factors into three categories; the first category is the developed physical qualities factor which further contains seven sub-elements infrastructure, face, design of rooftop, right of way, plan layout of floor, specifications of product and overall physical qualities of a house. The second category is the developed concept environmental factor which further consists of nine

sub-elements of scale development, green concept, cluster concepts, grand cluster concepts, story and theme, premium facilities, type variation, following trends, and overall concepts. The green concept trait relates with to encouraging real estate developers to create and make housing products and environments that endorse healthier and better life quality (Jim and Chen, 2006; Sanders and Polasky, 2009 Singh et al. 2010). The third category is the location environmental factor which further contains of eleven sub-elements including location near family, location near shopping center, location near activities center, good social communication, location near working area, location near religious center, ease of accessibility, location near education centers, good security system, direct toll roads access and uniqueness of location. Waddell et al. (1993), Boarnet and Chalermpong, (2001), and Vadali (2008) reported that direct toll road access has emerged one of the main price boosters for sales of housing products. The Graph theory proposed by Leonhard Euler (1736) stated that graphs can be used to model different types of processes and relationships in physical, biological, and social information systems. It states that many factors influence one main system. In the view of graph theory, the study connects environmental factors that influence resident house price perception.

Rahadi et al., (2015) reported that these factors should be explored in other regions to measure the reliability and validity of the research. The aim of the study is to examine the following relationships;

- To find out the important factors which influence resident house price perception
- To investigate the relationship between physical quality, concept and location factors and resident house price perception
- To examine the impact of financial condition and brand developer factors on resident house price perception and
- To explore the significant difference in resident house prices perception in Rawalpindi and Islamabad.

The study has been tried to empirically test the hypotheses that which factors significantly play an important role in the fluctuation of resident house prices perceptions in the context of Pakistan.

Hypotheses of the study

In the light of research literature the study has been tested the following hypotheses;

H 01: There is a positive impact of physical condition on resident house prices perception.

H 02: There is a direct relationship between concept factor and resident house prices perception.

H 03: Location factor has a direct impact on resident house prices perception.

H 04: There is significant difference in resident house prices perception in Rawalpindi and Islamabad cities.

Data and Research Methodology

Selection of Sample

The data sample contains areas of Islamabad and Rawalpindi. The questionnaires have been distributed to 150 respondents in the sample region. The questionnaire scale was adapted from the past studies of Rahadi et al., 2015) and (Rahadi et al., 2013) to investigate the relationship between factors and resident house price perception in the context of Pakistan. Respondents have been asked about their resident house price preferences about three main subscales; physical qualities factor, concept factor, and location factor. For physical qualities, they have been asked about the condition of infrastructure, design of the rooftop, preferences about façade, floor plan layout, right of way of the roads, specifications of the product, and overall physical quality of a house. Preferences of concept factors contain questions regarding the introduction of the green concept in the development, story, and theme of the development, how large the development scale, cluster and grand cluster concept, trendy development, premium facilities provided by development, house type variations, and overall concepts. Finally, preference of location facto consists of asking questions regarding location near family, location near shopping center, direct toll access to roads, location near the workplace, location near education centers, location near activities center, good security system, location near religious center, good social communication between dwellers and uniqueness of overall location preferences.

So, the required data has been collected through designed questions from the respondents.

Variables

The study has been investigated the three basic factors physical condition, concepts and location on resident house prices in the context of Pakistan. The analysis has been done across two major cities in the context of Pakistan. In this study, the consumer point of view variables like contractor/ developer brand, financial condition, and lifestyle have been used as control variables.

Measurement of Physical condition Variable

The study has measured the physical qualities variable, by asking Rahadi et al., (2015) study questions about infrastructure condition, façade preferences, ROW of the road, design of housing rooftop, plan layout of floor, specifications of the product and the overall physical qualities of a house.

Measurement of concepts Variable

The concept factor variable has been measured, by asking Rahadi et al., (2015) study questions about Preferences of concept sub-scale contains how large is the development scale, introduction of green concept in the development, trendy development, cluster and grand cluster concepts, story and theme of the development, premium facilities provided by the development, housing type variations and overall concepts.

Measurement of location Variable

The location which is third explanatory variable has been measured, by asking Rahadi et al., (2015) study questions about preference od location sub-scale contains location near family, direct toll access to roads, location near activity center, location near education center, good social communication between dwellers, proper security system, location near to religious center, location near shopping center, location near workplace, uniqueness of location and the overall location preference of the consumers.

Statistical Measurement

The research study has been used the descriptive statistics, correlation analysis and regression analysis in order to investigate the relationship in the context of Rawalpindi and Islamabad.

Regression Model

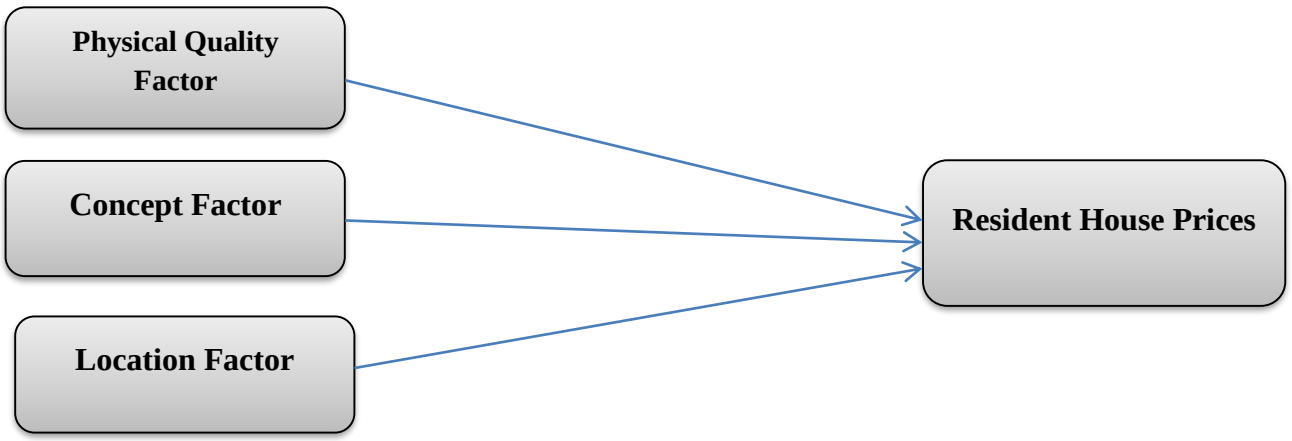
The following regression model has been used in the study;

$$Rhp = \alpha + \beta 1(Phc) + \beta 2(Con) + \beta 3(CLoc) + +\beta 4(Brd) + \beta 5(Fin) + \beta 4(IsbDum) + \sigma \ldots\ldots \text{(I)}$$

Where;

α = Intercept, β= Coefficient of variables, Rhp= Resident house prices, Phc= Physical Condition, Con= Concept, Loc= Location, Brd= Developer brand, Fin= Financial condition, IsbDum= Use dummy variable and put 1 if the city is Islamabad and 0 otherwise., σ = Error Term.

Theoretical Model:



Results and Discussions

The sample data used in this study is primary data which is collected through Rahadi et al., (2015) and Rahadi et al., (2013) questionnaires from different towns of Rawalpindi and Islamabad to examine how different environmental factors like physical quality factors, concept factors, and location factors influence the house resident price perception of people. The study has used the three measures of resident house price perception; the 1st price perception of the 05 Marla resident house, the 2nd price perception of the 10 Marla resident house, and the 3rd price perception of the 01 Kanal resident house. The research has applied descriptive statistics, correlation analysis, reliability analysis, and regression analysis to investigate the relationship between environmental factors and resident house price perception.

Response Rate of Questionnaires

The research study distributed a total of 120 questionnaires in different towns located in Rawalpindi and Islamabad in which 100 questionnaires were received back, which indicates that the response rate is 83.33%. Punch (2003) reported in its article that an eighty-to-eighty-five percent response rate is good for questionnaire distribution in a research study.

Reliability analysis

Reliability analysis plays an important role in qualitative type research studies. The reliability test tells us whether the instruments used in the research are reliable for our study or not. Borg, Gall, and Gall (2003) stated in their article that a reliability test is a measurement technique in which research tools give us reliable data and results afterward recurrent trials. The table-01 states the Cronbach's alpha values of all variables used in this study. The Cronbach's alpha values of all variables greater than 0.70 or 0.65 limit which is the acceptable level for further analysis.

Table-01 Cronbach's alpha values of variables

Variable Name	Cronbach's Alpha	No of items
Physical factor	0.781	3
Concept factor	0.759	3
Location factor	0.807	7
Brand factor	0.786	3
Financial condition factor	0.678	2
Average price of 05 Marla	0.875	3
Average price of 10 Marla	0.808	3
Average price of 01 Kanal	0.848	3

Multicollinearity analysis

Multicollinearity analysis is also required to perform regression analysis. The multicollinearity test tells us a strong correlation among independent variables which can make biased coefficients and lead us to a wrong estimation. Researchers have suggested Tolerance level and Variance Inflation Factor (VIF) for formal detection of multicollinearity. A Tolerance level of less than 0.20 or 0.10 and a VIF of 5 or 10 and above indicates a multicollinearity problem in regression analysis. The table- 02 reports the Tolerance level and Variance Inflation Factor (VIF) values of all independent variables. All variables Tolerance level values are greater than 0.20

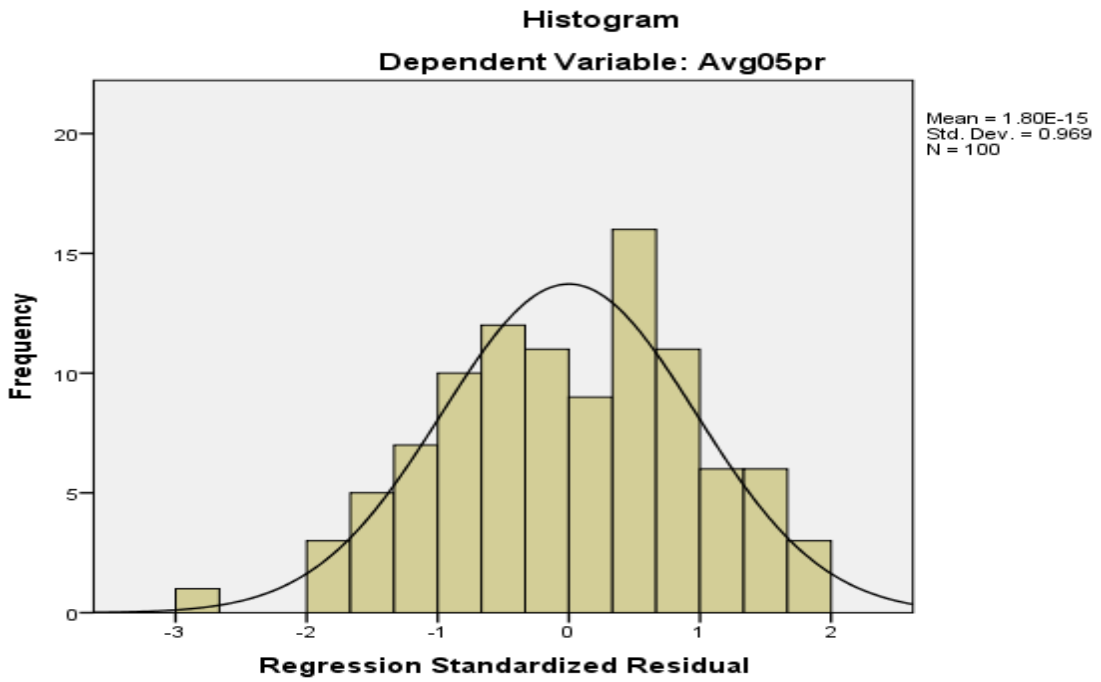
and Variance Inflation Factor (VIF) values are less than 5 which means that there is no multicollinearity issue in the regression analysis.

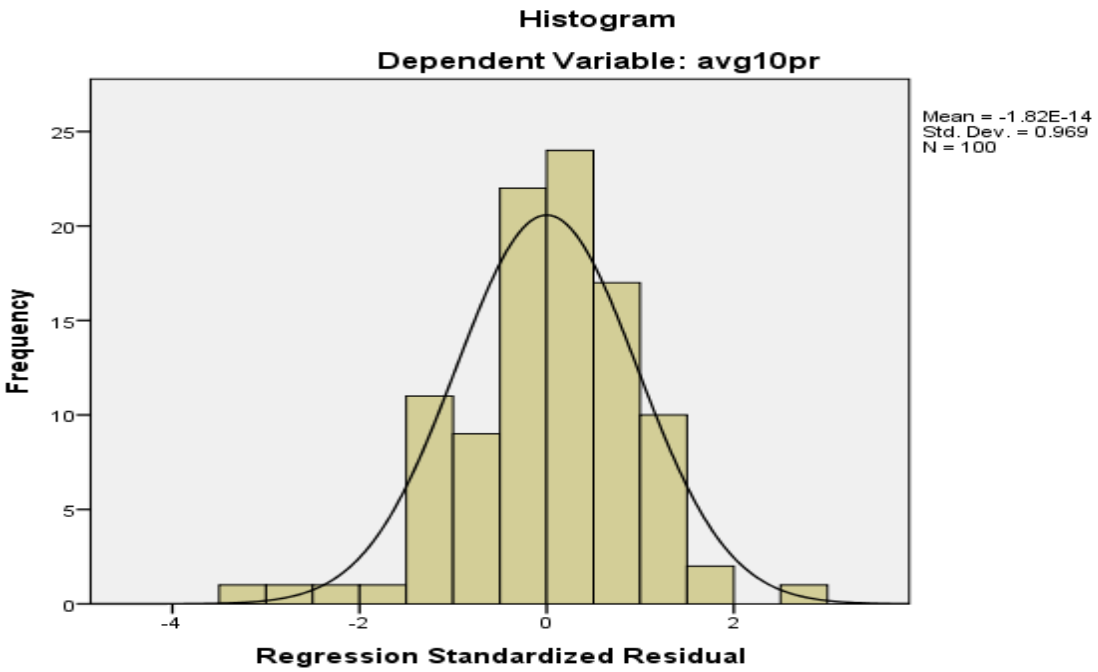
Table-02 Tolerance Level and VIF values of Independent variables

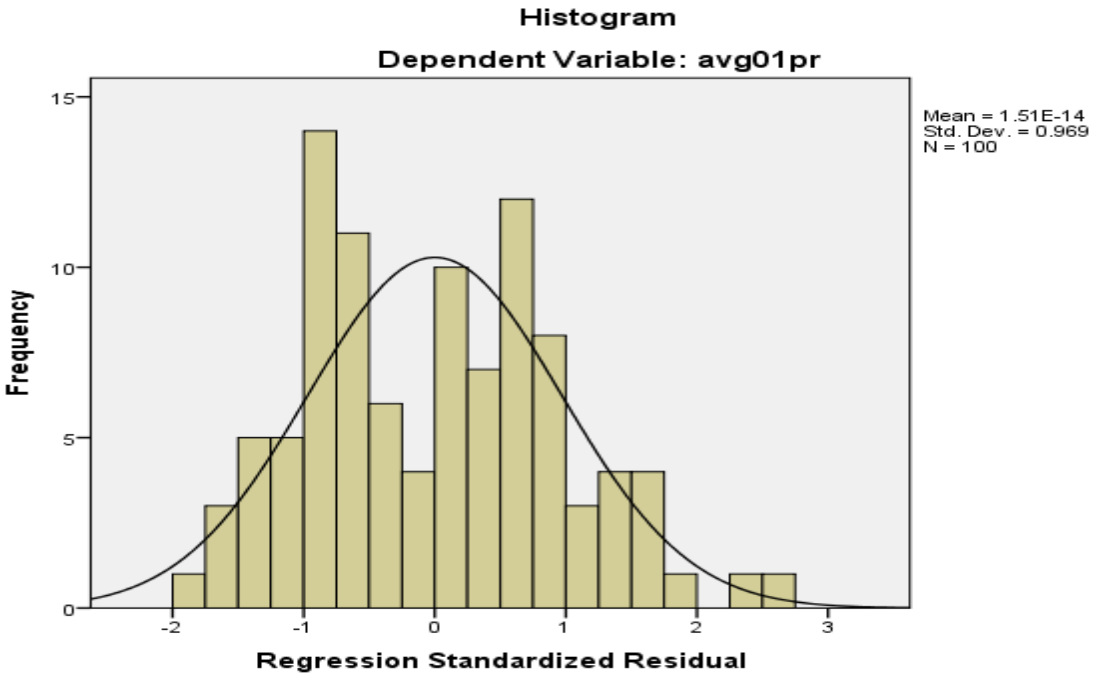
Variable Name	Tolerance Level	VIF
Physical factor	0.299	3.342
Concept factor	0.292	3.426
Location factor	0.293	3.412
Brand factor	0.268	3.730
Financial condition factor	0.504	1.985
Dummy variable for Isb	0.951	1.051

Normality analysis

The data and error terms should be normally distributed to perform regression analysis. It tells us the data distribution and the residual distribution of the regression analysis. Usually, researchers used and suggested Histograms and the Jarque Bera test for normality of error terms distribution. The Jarque Bera test value should be less than 5.99 and the p-value less than 0.05 for normal distribution but if the Jarque Bera value, is greater than 5.99 and the p-value is greater than 0.05 then there is a data normality issue in the regression model. The histograms for all three regressions are given below which indicates that the error terms are normally distributed in all three regression models.







Descriptive statistical analysis

The descriptive statistical analysis is also an important element in research study which tells us the description and nature of data that we have used in the analysis. Usually, in descriptive analysis, a researcher is interested in knowing about the mean, standard deviation, minimum, and maximum values of all variables to apply accurate statistical techniques for further analysis. The table-03 states that a total of 100 observations have been used in the

study. The average value of the respondent's age is 35.63 with a standard deviation of 10.04, the minimum respondent age is 20 and the maximum respondent age is 60. The Gender variable indicates that most of the respondents are male and the female ratio is low because of cultural influence. The marital status state that data is collected from all types of respondent's marital status like single, married, divorced, and other. The education levels of respondents range from metric to PhD level. There are three dependent variables have been used in this study, first one is the natural log of average price in Pakistani rupees of 5 Marla house price (Avg05pr), second one is the natural log of average price in Pakistani rupees of 10 Marla house price (Avg10pr) and third one is the natural log of average price in Pakistani rupees of 01 Kanal house price (Avg01pr). The mean value of avg05pr is 15.73 with a standard deviation of 0.34; the mean value of avg10pr is 16.39 with a standard deviation of 0.35, the mean value of avg01pr is 16.97 with a standard deviation of 0.36. The mean value of the physical quality factor is 6.28 with a standard deviation of 0.94. The mean value of the concept factor is 6.35 with a standard deviation of 0.85. The mean value of the location factor is 6.60 with a standard deviation of 0.64. The mean value of the brand factor is 6.17 with a standard deviation of 0.94. The mean value of the financial condition factor is 5.43 with a standard deviation of 0.83. The mean value of the Islamabad dummy variable is 1.18 with a standard deviation of 0.41.

Table-03 Descriptive Analysis

Variable Name	Minimum	Maximum	Mean	Std. Deviation
Age	20.00	60.00	35.6300	10.04400
Gander	1.00	2.00	1.1700	0.37753
Marital Status	1.00	4.00	1.7700	0.72272
Education	1.00	5.00	3.3300	0.80472
Avg05pr	14.84	16.45	15.7347	0.33547
avg10pr	15.65	17.18	16.3944	0.35414
avg01pr	16.11	17.62	16.9716	0.36427
Phy_fac	4.00	7.67	6.2867	0.94640
Con_fac	4.33	7.67	6.3500	0.85723
Loc_fac	5.25	7.63	6.6013	0.64125
Brd_fac	3.67	7.67	6.1767	0.94573
Fin_fac	3.00	7.00	5.4350	0.83380
IsbDum	1.00	3.00	1.1800	0.41145
Observation (N)		100		

Correlation analysis

Correlation analysis is an important statistical analysis that tells us the degree and sign of the relationship between dependent and independent variables. The table-04 reported the correlation analysis matrix between environmental factor variables and residence house price perception variables. There are three residence house price perception measures (dependent variables) have been used in this study which are all highly correlated with each other. There are five independent variables has been used in this study in which three are environmental factor variables (physical quality factor, concept factor, and location factor) and two are consumer point of view variables (developer brand factor and financial condition factor) which are controlled in this study. The table=04 reported that there is a positive and significant correlation between concept factor, location factor, financial condition factor, and residence house price perception at a 01 percent significance level. The study found a positive and significant correlation between physical quality factor, developer brand factor, and residence house price perception at a 05 percent significance level. The study also stated a positive but insignificant correlation between the Islamabad dummy variable and residence house price perception. The overall results of table-04 suggested that there is a strong positive correlation exists between environmental factors and residence house price perception in the context of Rawalpindi and Islamabad.

Table-04: Correlation analysis Matrix of variables

Variable Name	Avg05pr	avg10pr	avg01pr	Phy_fac	Con_fac	Loc_fac	Brd_fac	Fin_fac	IsbDum
Avg05pr	1								
avg10pr	.818**	1							
avg01pr	.676**	.714**	1						
Phy_fac	.202*	.215*	.152	1					
Con_fac	.261**	.274**	.178	.141	1				
Loc_fac	.592**	.575**	.423**	.137	.354**	1			
Brd_fac	.232*	.260**	.198*	.201*	.133	.218*	1		
Fin_fac	.616**	.578**	.378**	.146	.237*	.695**	.199*	1	
IsbDum	.074	.006	.177	-.068	-.155	-.065	-.159	-.098	1

**,* . Correlation is significant at the 0.01 and 0.05 level (2-tailed)

Regression analysis

The study has investigated the relationship between environmental factors and resident house price perception by using regression analysis. The research runs three regression models concerning three different resident house price perception measures (dependent variables) as the price of 05 Marla house price, 10 Marla house price, and 01 Kanal house price with environmental factors (independent variables). The first regression model run between residence house price perception about 05 Marla house and environmental factor variables which reported R square 47.4%, F-value 13.975, p-value 0.000, and Durbin Watson value 1.389 which tells us the goodness of the model. The model explains a 47.4% variation in the average price of the 05 Marla house. The sign of the coefficients of the location factor, financial condition factor, and Islamabad dummy variable are 0.141, 0.159 and 0.133 t-values are 2.47, 3.75, and 2.11, and p-values are 0.015, 0.00, and 0.00 respectively which indicate that location factor, financial condition factor and Islamabad dummy have a significant direct relationship with resident average 05 Marla house price perception. Statistically, it can be interpreted that one unit increase in location factors will bring a 0.141 % increase in resident house price perception of 05 Marla house at 05 % significance level while other things remain constant. One unit increase in the financial condition of dwellers will bring a 0.159 % increase in the resident house price perception of 05 Marla house at 01 %significance level while other things remain unchanged. For the third dummy variable, when the resident house changes from Rawalpindi to Islamabad then it will bring 0.133 % increase in the resident house price perception of the 05 Marla house at 01 % significance level while other things remain constant. It means that improvement in location factors, financial condition, and housing in Islamabad city can increase the resident house price perception of 05 Marla houses which proved the study hypotheses. The sign of the coefficients of physical quality factor, concept factor, and brand developer factor variables are positive but found an insignificant relationship with resident average 05 Marla house price perceptions which stated that the study did not find any significant relationship between these variables. The second regression model run between residence house price perception about 10 Marla houses and environmental factor variables which reported R square 43%, F-value 11.682, p-value 0.000, and Durbin Watson value 1.506 which indicates the goodness of the model. The model explains a 43% variation in the average price of 10 Marla houses.

The coefficients signs of location and financial condition factors are positive and values are 0.155 and 0.143, t-values are 2.46 and 3.06, and p-values are 0.016 and 0.003 respectively which state that location factor has a positive and significant association with a resident average of 10 Marla house price perception at 05% significance level while financial condition factor has positive and significant association at 01% significance level with average house price perception of 10 Marla house. Statistically, it can be understood that one unit increase in location factor will bring 0.155 units change average price perception of 10 Marla houses and vice versa while other things remain unchanged. For statistical interpretation of the financial condition, it can be read that one unit change in the financial condition of a resident will bring 0.143

units direct change in 10 Marla average house price perceptions while other things remain constant. The sign of the coefficients of the physical quality factor, concept factor, brand developer factor, and Islamabad dummy variables found positive but insignificant associations with 10 Marla residents' average house price perceptions. The model states that there is no significant difference concerning location in the case of 10 Marla house price perceptions. In the third regression model the 01 Kanal resident average house price perception regressed by three environmental factors, two consumer point of view factors, and a dummy variable for Islamabad city which report R square 26.4%, F-value 5.571, p-value 0.000, and Durbin Watson value reported 1.062 which similarly show goodness of fit of the model. It explains 26.4% variation in 01 Kanal resident average house price perception. The sign of the coefficients of the location factor and Islamabad dummy variable is positive and values are 0.150 and 0.216, t values are 2.04 and 2.67 and p-values are 0.044 and 0.009 respectively which indicate that the location factor has a direct and significant association with resident average house price perception of 01 Kanal house at 05% significance level and Islamabad dummy variable has a significant association with 01Kanal resident average house price perception at 01% significance level. From a statistical point of view, it can be interpreted that a unit increase in location factor will bring a 0.150 units increase in resident average house price perception of 01 Kanal house and vice versa while other things remain constant. The change of location from Rawalpindi to Islamabad will bring 0.216 units increase in resident average house price perception of 01 Kanal house and vice versa while other things remain unchanged. In case of 01 Kanal house price perception financial condition of the dweller does not matter but the Islamabad and Rawalpindi location significantly matters in price perception determination. The results found in the statistical analyses are consistent with the findings of Rahadi et al. (2013, 2015) who also supported that location and financial condition factors significantly and positively contribute to resident house price perception in Indonesia.

Table-05: Regression Analyses Matrix of Three House Price Measures and Environmental Factors

Variable Name	Dependent Variables: Avg05pr (Average 05 Marla Price)			Avg10pr (Average 10 Marla Price)			Avg01pr (Average 01 Kanal Price)		
	Coefficient	t-stat	P-value	Coefficient	t-stat	P-value	Coefficient	t-stat	P-value
Phy_fac	.021	1.14	.255	.025	1.23	.221	.020	.821	.414
Con_fac	.019	.882	.380	.023	.940	.349	.016	.573	.568
Loc_fac	.141	2.47	.015	.155	2.46	.016	.150	2.04	.044
Brd_fac	.023	1.18	.241	.031	1.41	.159	.033	1.31	.193
Fin_fac	.159	3.75	.000	.143	3.06	.003	.074	1.36	.177
IsbDum	.133	2.11	.037	.082	1.18	.240	.216	2.67	.009
C	13.427	46.18	.000	14.067	44.01	.000	14.946	40.02	.000
R-squared	0.474			0.430			0.264		
Adjusted R-squared	0.440			0.393			0.217		
Durbin-Watson stat	1.389			1.506			1.062		
F-statistic	13.975			11.682			5.571		

Prob (F-statistic)	0.000	0.000	0.000

Conclusion and Policy Implications

The study examines the impact of three environmental (physical quality, concept, and location) factors on resident house price perception about the average price of 05 Marla houses, 10 Marla houses, and 01 Kanal house across twin cities Islamabad and Rawalpindi. The resident house price perception (dependent variable) has been measured in three different dimensions which are the log value of the 05 Marla house price, the log value of the 10 Marla house price, and log value of the 01 Kanal house price which are further regressed by environmental factors. The data has been collected through Rahadi et al., (2013) and Rahadi et al., (2015) administrated questionnaires from different towns of Rawalpindi and Islamabad. The research has applied descriptive statistics, correlation analysis, reliability analysis, and regression analysis to investigate the relationship between environmental factors and resident house price perception. In the light of theoretical and empirical evidence, the study concluded that there is a significant relationship between location factor, financial condition factor, and Islamabad dummy variable about resident house price perception of 05 Marla houses. It indicates that in 05Marla houses location factors like near to shopping centers, near to highways and roads, near to schools, and near to facilities have highly contributed to house price determination. The financial condition factor also matters in 05 Marla houses because usually, people buy small 05 Marla houses when their low level of income becomes stable and grow up. In the case of 05 Marla houses, there is a significant difference in Rawalpindi and Islamabad. With respect to 10 Marla houses the study concluded that there is a significant relationship exists between location factor and financial condition factor with resident house price perception of 05. It refers that in 10 Marla houses location factors like near to shopping centers, near to hospitals, near to offices and schools and near to other facilities have greatly influenced resident house price determination. The financial condition factor matters in 10 Marla houses because usually, people buy 10 Marla houses when their level of income becomes stable and grow up. In the case of 10 Marla houses, there is no significant difference of location found between Rawalpindi and Islamabad. In the case of 01 Kanal houses the study concluded that there is a significant relationship exists between the location factor and the Islamabad dummy variable to resident house price perception of 01 Kanal houses. It argues that in 01 Kanal house's location factors like near to roads, near to offices, near to schools, and near to facilities have enormously contributed to house price perception determination. In the case of 01 Kanal houses, there is also a significant difference between Rawalpindi and Islamabad. The financial condition factor was found insignificant which means that in 01 Kanal houses, financial condition does not matter because usually people buy big 01 Kanal houses when they have a high level of income and enough money.

The overall findings of the study argued that location factor, financial condition factor, and Islamabad and Rawalpindi residence location mainly influence resident house price perception in the context of Pakistan. The findings of the research are parallel to the studies of Rahadi et al., (2013) and Rahadi et al., (2015). Physical quality, concept and brand developer factors found insignificant in resident house price determination in this study. Further research can be needed to investigate these factors in a comprehensive way and with large sample size in relation to resident house price perception.

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