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## An Analysis of Factors Affecting Housing Values in Swat, Pakistan

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### ABSTRACT

**Purpose:** Housing is an essential requirement that can improve the quality of life. A house has a specific value varying from time to time and place to place. However, several factors exist that affect housing values. This study is worked out to investigate the factors that affect the housing prices in district Swat, Pakistan.

**Research Gap:** The present study bridges the gap by figuring out the dynamic factors affecting housing values in urban area of district Swat.

**Design/Methodology/Approach:** The primary data was collected through a survey and a proper questionnaire was designed to record the responses of respondents. A sample size of 65 respondents from three specific areas is taken using simple random sampling technique. The data is analyzed using SPSS software and results are obtained mostly through frequencies and descriptive statistics.

**The Main Findings:** The findings of the study discovered that size of the house, safe location, environmental amenities such as access to clean water and clean air, condition of the house, and availability of utilities i.e., Electricity, Gas, and Water strongly affect the housing prices. The results also showed that public transport facility, parking facility inside the house, and rooms with attached washrooms affects the housing value.

**Theoretical/Practical Implications of the Findings:** The study has some implications for society as well as for government. It recommends that environmental quality should not be compromised as a clean and pleasant environment is strongly linked with quality of housing. The government should improve the drainage system within cities and villages because poor drainage systems cannot resist an unexpected flow of water and mostly shape them into flood.

**Originality:** The present work is a genuine study carried out for research purposes and maintained originality. Preceding studies have not identified the factors like houses having their own walls (not supported by neighbor's walls), rooms having attached washrooms, and congested street as determinants of housing value that has been addressed by the current study.

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### 1. Introduction

House pricing is one of the most frequently discussed subjects in recent years. In general, plentiful researchers, and scholars have concluded the various elements determining home prices. Social and

economic policy, as well as urban development have previously concentrated on housing. According to (Lee, 2009), the housing price is the amount that must be paid in exchange for purchasing a residential property primarily from the buyer's point of view. Housing availability for all is necessary for the efficacy as well as effectiveness of housing systems for delivery (Tan et al., 2008).

But affordability is now a major barrier towards becoming a homeowner. The cost of housing in the major cities has jumped to an unreasonable level in the past few years (Kamal et al., 2016). A society's development also depends on housing, which has an impact on both the economy and wellbeing. Housing investment helps to create fixed capital, jobs, and have significant links with the rest of the economy. In the modern day, housing, which provides shelter, is one of the most crucial elements of the socioeconomic sector (Babalola et al., 2013).

Usually, factors that influence the housing value may be external or internal. External factors such as population, housing location, water and air pollution, open drains, distance to work area, and market influence the housing value (Can, 1990). The internal factors that affect the housing value include the age of the house, the house size, availability of utilities, the number of rooms etc. (Kiran & Hussain, 2018). Internal and structural factors such as quality of house and its building condition, number of rooms as well as structural qualities such as water system and pool are factors influencing the house prices (Selim, 2008).

Furthermore, people are willing to pay more for new houses, more covered areas, kitchen, garage, lawn and drinking water supply (Ali et al., 2015). There exist some economic determinants which affect the house prices such as Base Lending Rate (BLR) and Gross Domestic Price (GDP) (Zandi et al., 2015). An important part of wealth is housing. It is crucial to comprehend how these swings affect households' consumption choices because housing prices fluctuate significantly over time (Campbell & Cocco, 2007).

Environmental amenities also play a key role in maintaining the quality of housing but environmental disamenities are considered as declining factor in the worth of house. If environmental disamenities exist in an area, it impacts the house prices negatively (Sheikh, 2016). According to (Ali et al., 2015), various features such as air, water & pollution are having a direct impact on house valuation. We may contrast properties with similar attributes and look at price and non-environmental elements to see how willing people are to pay for a better environment.

There are also some macroeconomic determinants that have an impact on house prices such as CPI as studied by (Ge, Janet & Yue, 2007). They came up with a result that higher inflation will lead to upsurge the property value. The main contributors to rising property values are greater construction costs and higher energy usage. Moreover, house prices will drop if interest rates, housing supply, and inflation increase, while local currency appreciation and a boost in GDP will drive prices to climb. It was discovered that stock prices have no impact on home prices (Pinjaman & Kogid, 2020).

The primary factor that influences a buyer's decision to purchase a home is the price of the property. However, other factors that purchasers consider include location, accessibility, amenities and more (Ameera et al., 2012). Some studies explored that playing amenities are also linked with housing value. For instance, (Asabere and Huffman, 2009), revealed that the amenities like closeness to golf course, playground in neighborhood, neighborhood court, pool in neighborhood are all significant to house value.

Some additional factors like the average income of the household, satisfaction from neighbor and earthquake risk of the area have impact on the residential prices (Keskin, 2008). Furthermore, (Rachmawati et al., 2019) also argued that price, quality, location, promotion, and commercial image have positive and significant effects on the purchase decision of customers.

## **2. Theoretical Framework**

A lot of studies have been conducted that explore the relationship between house pricing and factors that affect these prices. Usually, factors that influence the housing value may be external or internal. The

internal factors that affect the housing value include age of the house, size of the house, number of rooms, availability of utilities etc. (Kiran and Hussain 2018). According to Khalid (2016), environmental disamenities also affect property value. If environmental disamenities exist in an area, it has a negative impact on house prices. It is also revealed by the study of Selim (2008) that quality of house and its building, size of the house and number of rooms as well as structural qualities such as water system and pool are factors influencing the house prices.

Keeping in view these factors, the current study is conducted to investigate the factors that either positively or negatively affects the house prices in district Swat, Pakistan. These previously discussed are some factors that support our study and used as a theoretical framework for this research.

Selim (2008) examined the factors that determine the Turkey's house prices. The author discovered that the number of rooms, size of the house, as well as other structural features like a water system, pool, and natural gas are the most significant factors that influence housing prices. Ali et al. (2015) by utilizing the hedonic approach explored that consumers are willing to spend extra for new homes, covered outdoor space, kitchens, garages, lawns and drinking water supplies despite living in residential areas. Zandi et al. (2015) investigated a study on the economic factors affecting the residential property price in Penang Island, Malaysia. It was found that there are two strong economic factors that influence the property values that are; Base Lending Rate (BLR) and Gross Domestic Price (GDP).

Clean water also influences housing value as (Nicholls and Crompton, 2018) conducted a detailed examination of the data supporting the relationship between the surface water quality and house prices. They provide strong evidence that clean water positively affects property values. The factors affecting the market prices of residential housing are discussed by Mbachu & Lenono (2005). They concluded that location, conditions of market, micro and macroeconomic dynamics and building landscapes are the most significant factors that affect the market value of residential properties in Johannesburg CBD.

Furthermore, Lin et al. (2014) used hierarchical linear model to examine how socioeconomic characteristics in the USA affect local house prices. The study reveals the following findings; primarily, the population, the percentage of seniors in the population and violent crime rates have greater effects on home prices in the Northeast than in the West. Secondly, population yields higher housing prices in the Northeast than in the Midwest. According to (Can, 1990), external factors such as population, housing location, water and air pollution, open drains, distance to work area and market influence the housing value. (Akkay, 2021) further explored the macroeconomic determinants of the housing price and linkage among house prices and their underlying macroeconomic factors in Turkey by using ARDL bounds to cointegration and Granger Causality test. Results from the analysis showed that the relationship between housing pricing and housing interest rates is significantly negative. Moreover, it was noticed that depreciation of Turkish Lira against US dollar and the rise in the level of employment had an increasing impact on housing prices.

Moreover, (Ge, Janet & Yue, 2007) investigated the main variables influencing residential property values in the Auckland, New Zealand using Entropy method. The study revealed that the number of bedrooms, consumer price index CPI, area of land, and location are the most important variables that contribute to the property values. (Boxall & McMillan, 2005) discussed the impact of oil and natural gas facilities on rural residential property values in Canada. The study by using the spatial error model revealed that the number of oil batteries and sour gas wells within 4 kilometers of a property has a detrimental impact on property values.

Wahid et al. (2022) further analyzed the residential properties pricing in Islamabad and Rawalpindi which are the cities of Pakistan. The authors applied extreme bound analysis and the least bound shrinkage and selection operator as methodology of their research. The study revealed that market assessment of residential properties in these two cities are related to many factors including location of the property, features of the neighborhood, environmental features, structural features, and qualities of administration of local housing societies.

Keskin (2008) studied hedonic analysis of price in the housing market to discover the factors that influence housing prices in Istanbul. By applying the hedonic price model, the study revealed that housing prices are influenced by area size of living, living in a low story building, living in a secured location, and age of the building. Solak (2016) illustrated a study on an econometric analysis of housing demand in Turkey. Using the panel data analysis and data set at provincial level between 2004-2011, the author chosen the level of income, prices of housing and population as explanatory variables in their study. The results showed that the housing demand is influenced positively by indicators of population. It was further found that level of income of Turkey is a big factor of influencing the housing demand. (Bui, 2020) also examined factors influencing the price of apartments in Vietnam. The study was shown by gathering survey data of 124 apartments positively operated throughout the first six months of 2019. The result from the regression analysis showed that apartment size, existence of balcony, swimming pool presence, shopping mall presence and periodic rental income have a positive impact on prices of apartment. Furthermore, closeness to the city center negatively impacts the prices of apartment.

A study was investigated by Gratia & Prasetyo (2021) on determining the variables affecting housing prices in Indonesia for first-time homebuyers. This paper was a part of thesis research whose objective was to examine the relationship between prices of housing, preferences of first-time home buyer and outside factors rising that affect the price. It was found that the price level for a first-time home buyer is affected by economic circumstances, means of payments, location, physical qualities, amenities, architecture, and aesthetic aspects. Shida (2022) also explored some macroeconomic determinants of house prices and rents by using panel error correlation model. Findings revealed that bank lending and per capita income have a significant and positive affect on the house prices whereas the housing stock per capita and rates of interest affects the house prices negatively. The results also exhibited that interest rates and housing stocks negatively affects the house rents.

Kamal et al. (2016) illustrated a study on factors influencing the housing price in Malaysia. The authors utilized online and face to face survey as their methodology to obtain findings. It was found that location, industry factors, macroeconomic and demographical factors are the key factors affecting the price of houses. According to Khalid (2016), environmental disamenities also affect property value. The author adopted the hedonic property model and revealed that if environmental disamenities exist in an area, it has a negative impact on the nearby area's properties.

In the literature, economic, social, and environmental variables have been identified as potential factors of housing prices. However, the preceding studies have not identified that factor of house having its own walls (not supported by neighbor's walls), rooms having attached washrooms, and congested street as determinants of housing value that has been addressed by the current study. This study further contributes to the existing literature by prioritizing the factors to find out the most influencing factor that affects the housing value. Hence, this study adds something new to the existing body of literature

### **3. Analytical Framework**

The data for this research is primary in nature which is collected from the respondents through questionnaire. The research is quantitative in nature. A questionnaire is developed to collect data from the respondents. This study utilizes simple random sampling (SRS) technique for data collection. Total of 65 respondents are randomly selected from three areas of Mingora city, district Swat using sample size calculator. The total population of Mingora city is 331091, based on this population size with a confidence level of 90% and 10% margin of error while population proportion is 39%, the resulted sample size is 65.

#### **3.1 Analytical Tools**

Analytical tools for this study are descriptive statistics, frequencies distribution, cross tabulations, priority and agreement indices. Frequency distribution is carried out through bar chart and frequency tables to obtain the results using SPSS.

For the top priority variable that most influences the housing value, priority indices are calculated for five variables. Finally, agreement indices are calculated for each statement to check whether the agreement scores are positive or negative where positive suggests the preference towards agreement while negative suggests preference of respondents towards disagreement. The agreement levels were scaled from -2 to +2.

The rationale behind choosing these analytical tools is that the data is primary in nature collected through questionnaires. So, descriptive statistics, frequency distribution and Likert scales are suitable tools to analyze the results

**4. Results & Discussion**

**Table 1: Descriptive Statistics of Quantitative Variables**

Variable	Minimum	Maximum	Mean	Std. Deviation
Education level	1.00	5.00	3.7077	1.11416
Size of the house	0.00	4.00	1.6462	1.17833
Number of rooms	0.00	3.00	2.0308	.88334

Source: Authors' compilation

Table 1 represents the respondent's descriptive statistics of quantitative variables. The maximum education level of the respondent is 5(means above graduation) while the minimum education level is 1(Middle level of education). Moreover, the maximum size of the house of respondents is 4 (means above 1 kanal) while the minimum value is 0 (means less than 5 Marla). Similarly, the maximum number of rooms are 3 (means more than 6 rooms) while the minimum number of rooms are 0 (means 1 to 2 rooms).

**Table 2: Respondents' Responses to Different Questions**

Responses		Number	Yes	Total
Number of rooms affects the house's value	Frequency	2	63	65
	Percent	3.1	96.9	100
Conditions of house affect its value	Frequency	2	63	65
	Percent	3.1	96.9	100
Location affects the house's value	Frequency	12	53	65
	Percent	18.5	81.5	100
Congested streets affect the house's value	Frequency	17	48	65
	Percent	26.2	73.8	100
House with its own wall affects the house's value	Frequency	13	52	65
	Percent	20	80	100
Size of the house affects the house's value	Frequency	1	64	65
	Percent	1.5	98.5	100

Source: Authors' compilation

The above table represents the frequencies of the responses of respondents with percentages for different questions asked from them. Majority of the respondents 63 out of 65 that is 96.9% think that the number of rooms affect that value of the house which shows the positive relationship between number of rooms and value of the house. This result reflects the findings of Selim (2008) that number of rooms is one of the most significant factors that influence housing pricing. Similarly, the same is for the conditions of the house. 96.9% believes that conditions of the house affect the value of the house. The better the house conditions, the more is its value.

Furthermore, 53 out of 65 respondents, that is 81.5% think that location is an important variable, and it affects the value of the house. This result is consistent with many studies in the existing literature (Can 1990, Ge, Janet and Yue 2007). According to 48 out of 65 respondents that is 73.8%, congested street to the house affects the value of the house, 52 out of 65 respondents that is 80% think that house that is having its own walls affects the value of the house. Size of the house is believed to be the most important factor that affects the housing value. As per this survey, 98.5% that is 64 out of 65 thinks that size of the house affects the value of the house. This finding confirms the results of existing studies of literature (Kiran and Hussain 2018, Selim 2008).

**Table 3: Respondents’ Responses (Priorities for each variable)**

Priorities		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	Total
Size of the house	Frequency	19	24	15	4	3	65
	Percent	29.2	36.9	23.1	6.2	4.6	100
Availability of Sui-Gas	Frequency	5	5	9	20	26	65
	Percent	7.7	7.7	13.8	30.8	40	100
Condition of the house	Frequency	19	16	18	6	6	65
	Percent	29.2	24.6	27.7	9.2	9.2	100
Safe location	Frequency	17	12	13	12	11	65
	Percent	26.2	18.5	20	18.5	16.9	100
Environmental amenities	Frequency	5	8	9	24	19	65
	Percent	7.7	12.3	13.8	36.9	29.2	100

Source: Authors’ compilation

**Scales for Each Priority**

First Priority	Second Priority	Third Priority	Fourth Priority	Fifth Priority
1	1-0.2=0.8	0.6	0.4	0.2

Priority Index for Size of the house =  $1(19) + 0.8(24) + 0.6(15) + 0.4(4) + 0.2(3)/65 = \mathbf{0.763}$

Priority Index for Availability of Sui-Gas =  $1(5) + 0.8(5) + 0.6(9) + 0.4(20) + 0.2(26)/65 = \mathbf{0.424}$

Priority Index for Condition of the house =  $1(19) + 0.8(16) + 0.6(18) + 0.4(6) + 0.2(6)/65 = \mathbf{0.710}$

Priority Index for Safe location =  $1(17) + 0.8(12) + 0.6(13) + 0.4(12) + 0.2(11)/65 = \mathbf{0.636}$

Priority Index for Environmental amenities =  $1(5) + 0.8(8) + 0.6(9) + 0.4(24) + 0.2(19)/65 = \mathbf{0.464}$

**Table 4: Priority Index**

Priority	Variable	Priority Value	Rank
1 <sup>st</sup>	Size of the house	0.763	I
2 <sup>nd</sup>	Availability of Sui-Gas	0.424	V
3 <sup>rd</sup>	Condition of the house	0.710	II
4 <sup>th</sup>	Safe location	0.636	III
5 <sup>th</sup>	Environmental amenities	0.464	IV

Source: Authors’ compilation

The priority indices for the study variables are calculated to find out the most important factor for house value. The authors’ calculation produced that one of the variables which is size of the house ranked first. The reason for this is the index value for size of the house that is 0.763, relatively greater as compared with

all other values of other variables. The researcher observed through survey that the greater the size of the house, the higher is its value.

**Table 5: Number of Respondents' Responses Based on Their Agreement Level for Different Statements**

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Availability of utilities (electricity, gas, water) affect the value of house.	58	06	1	00	00
Value of the house is higher where public transport facility is available.	27	30	02	06	00
Quality of neighbor affects the value of house.	11	34	06	11	03
The value of zoned area house is more than value of non-zoned area house.	10	28	09	15	03
Open sewerage system in front of the house negatively affects its value.	29	32	02	02	00
The value of the house is higher where parking facility is available inside house.	37	24	00	04	00
Direction (east/west) of the house matters for the value of house.	13	37	06	09	00
What do you think congestion in residential area affects the value of house?	22	34	06	03	00
The value of the house is lower when structure of the house is not properly designed.	18	39	00	07	01
The value of the house is higher when rooms are having attached washrooms.	48	15	01	01	00


Source: Authors' compilation

The above table shows responses of households to various statements based on their level of agreement. As per the survey conducted from respondents, the results showed that 58 out of 65 respondents strongly agreed to the statement that value of the house will be higher when electricity, gas and water is available inside the house. The same has been explored by Kiran & Hussain (2018) that availability of utilities influences the housing value. Public transport is also an important factor in terms of housing value as 30 out of 65 respondents believes that value of the house is higher where public transport facility is available. The quality of neighbors is also an important variable for housing value.

Moreover, 28 out of 65 respondents agreed that the value of zoned area houses is more than value of non-zoned area houses. The same finding is revealed by Wahid et al. (2022). 32 out of 65 respondents agreed to the statement that open sewerage system in front of the house negatively affects its value. Parking facility inside house is also an influential factor that contributes to the worth of that house as 37 out of 65 respondents strongly agreed that when parking facility is available inside house, the value of that house will be worth. 37 out of 65 respondents agreed with the statement that direction(east/west) of the house matters for the value of house.

Furthermore, 34 out of 65 respondents agreed that congestion in residential areas affects the value of the house. The more the location is congested where the house is located, the lower will be the value of that

house and vice versa. 39 out of 65 respondents agreed that the value of the house is lower when structure of the house is not properly designed because structure of the house is also a considerable factor for the buyers. This finding is also consistent with Wahid et al. (2022) in the existing study of literature. Majority of the respondents 48 out of 65 strongly agreed that value of the house is higher when rooms having attached washrooms. According to the respondents, availability of utilities and rooms having attached washrooms are the most important and influencing factors that affect the house value.

**Scaling of Agreement levels** 

Scale	-2	-1	0	+1	+2
Level of agreement	SD	D	N	A	SA

Agreement index for statement 1 =  $\frac{2(58) + 1(6) + 0(1) - 1(0) - 2(0)}{65} = 1.88$

Agreement index for statement 2 =  $\frac{2(27) + 1(30) + 0(2) - 1(6) - 2(0)}{65} = 1.2$

Agreement index for statement 3 =  $\frac{2(11) + 1(34) + 0(6) - 1(11) - 2(3)}{65} = 0.6$

Agreement index for statement 4 =  $\frac{2(10) + 1(28) + 0(9) - 1(15) - 2(3)}{65} = 0.4$

Agreement index for statement 5 =  $\frac{2(29) + 1(32) + 0(2) - 1(2) - 2(0)}{65} = 1.36$

Agreement index for statement 6 =  $\frac{2(37) + 1(24) + 0(0) - 1(4) - 2(0)}{65} = 1.14$

Agreement index for statement 7 =  $\frac{2(13) + 1(37) + 0(6) - 1(9) - 2(0)}{65} = 0.83$

Agreement index for statement 8 =  $\frac{2(22) + 1(34) + 0(6) - 1(3) - 2(0)}{65} = 1.16$

Agreement index for statement 9 =  $\frac{2(18) + 1(39) + 0(0) - 1(7) - 2(1)}{65} = 1.03$

Agreement index for statement 10 =  $\frac{2(48) + 1(15) + 0(1) - 1(1) - 2(0)}{65} = 1.69$

**Table 6: Agreement Index**

Statement	Agreement Index value
Availability of utilities (electricity, gas, water) affect the value of house.	1.88
The value of the house is higher where public transport facility is available.	1.2
Quality of neighbor affects the value of house.	0.6
The value of zoned area houses is more than value of non-zoned area houses.	0.4
Open sewerage system in front of the house negatively affects its value.	1.36
The value of the house is higher where parking facility is available inside house.	1.14
Direction (east/west) of the house matters for the value of house.	0.83
What do you think congestion in residential area affects the value of house?	1.16
The value of the house is lower when structure of the house is not properly designed.	1.03
The value of the house is higher when rooms are having attached washrooms.	1.69

Source: Authors' compilation

Table 6 represents the agreement indices for the above-mentioned statements. The Agreement scores of all statements are positive, which indicates that on average, the inclination of respondents is towards agreement with the statements mentioned in table 5. The values of agreement index scales from -2 to 2. The positive scales that are 1 and 2 shows respondents' preference for agreement that is 1 for agree and 2 for strongly agree while negative scales show respondents' preference for disagreement that is -1 for disagree while -2 for strongly disagree.

### 5. Conclusion

House is one of the compulsory and essential needs of people. Over time, there are large swings in housing prices. There are many factors that affect the value of housing. The goal of was study is to investigate the factors influencing house prices in District Swat, Pakistan. A questionnaire was filled from 65 respondents through survey with an objective to investigate the factors that affects the housing price in three areas of Mingora, Swat. The study's findings made it quite evident that number of rooms and conditions of the house, location of the house, size of the house, house having its own walls (house not supported by neighbor's walls), and congested street to the house affects the price of house. Moreover, respondents were



asked to prioritize the factors to find out the most important factor for house's value. It was concluded from priority indices for each variable that size of the house was the most important factor for value of the house as per the respondents' perception. In the next stage, respondents were asked to state their level of agreement for different statements regarding housing prices. After calculating agreement indices for all the above-mentioned statements, it was concluded that agreement index values for all the statements are positive which means that the respondents agreed to these statements. Though, as per the respondents' perception, availability of utilities and rooms having attached washrooms are the most important and influencing factors that affect the house value.

It is recommended that the government should improve the drainage system within the cities and villages to avoid the overflow and over burden of water drainage system. Most of the times in these areas whenever it appears more rain, the drainage system fails to absorb the flow of water properly that probably damages the population and housing structure. The poor drainage system cannot resist an unexpected flow of water and shape them into flood as we just had a narrow escaped recently in most of the cities of Pakistan including Swat. Moreover, as the government deals with the habitat of the whole community and its prerequisites, so they should adopt such a plan of actions that comprise plantation that will improve quality of housing as plantation is one of the crucial environmental amenities. It is further recommended for the owner of the house or those who intend to build a house that they should concentrate on the availability of water, gas, and electricity as well as the inside parking space, direction, and location of the property because these are the most crucial and important variables that have an impact on the house's worth.

## **6. Limitation of Study**

Since the study is based on Mingora city only. Its finding cannot be extended to any other area without proper understanding and analyzing that area. For further research, the same study can be conducted on provincial or country level.

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