Journal of Management Science Research Review
https://jmsrr.com/index.php/Journal/about

Volume. 4 Issue No. 3 (2025)

Online ISSN: 3006-2047
Print ISSN: 3006-2039

DETERMINANTS OF HOUSE PRICES IN PAKISTAN

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Abstract
This study investigates the determinants of house prices in Pakistan with a focus on house characteristics, neighborhood attributes, and location-specific factors. Using secondary data from the Household Budget Survey (2014–2019) and applying a hedonic price model, the research analyzes how structural and contextual features affect housing values. Descriptive statistics, correlation, and regression analyses reveal that house characteristics exert the strongest influence on property prices, followed by location and neighborhood characteristics. The model explains 27% of the variation in house prices, indicating that structural, locational, and community-level variables play a meaningful but partial role in shaping property values. The findings align with international studies that emphasize the localized and multifactorial nature of housing markets. This study underscores the importance for policymakers, urban planners, and real estate stakeholders to integrate structural and environmental factors into housing policies, particularly in rapidly urbanizing economies like Pakistan. By addressing these determinants, sustainable housing affordability and equitable urban growth can be better achieved.

Keywords: House Prices, Hedonic Price Model, Neighborhood Characteristics, Housing Policy, Pakistan

Study Background
Real estate includes immovable property, such as land, and any permanent structures attached to it. This includes residential properties, as well as nonresidential properties like agricultural land, industrial sites, government buildings, and retail centers. For the purposes of this study, real estate refers specifically to housing. As a basic necessity,

Volume. 4 Issue No. 3 (2025)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

everyone should have access to affordable housing. To achieve this, governments must ensure that housing prices are sustainable and in line with income levels (Jensen, 2013). Furthermore, real estate is often used as collateral for loans, making price fluctuations a risk to financial intermediaries.

For years, the movement of house prices has been a major concern in the housing market, with extensive research done on the topic. The price of houses is closely tied to the dynamics of supply and demand within the market. According to Mankiw and Weil (2018), changes in demand have a significant impact on house prices, which are influenced by demographic shifts. However, Swan (2005) argues that Mankiw and Weil's predictions on house prices are misinterpreted. Swan (20055) suggests that predicting future movements in house prices should also consider supply factors, in addition to relevant demand variables. House prices tend to fluctuate around a fundamental economic variable (Bjork, 2013). It's common for house prices to fluctuate over time, but large fluctuations can cause problems in the property market. A decline in house prices can lead to capital losses for homeowners (Mankiw and Weil, 2014). However, if households can anticipate changes in house prices, they may be able to mitigate potential losses. The US housing market experienced a surge in prices starting in 1998, which was concentrated in certain states and metropolitan areas. In these areas, stories emerged of aggressive bidding on homes, homes selling quickly for above the asking price, and people rushing to buy homes without fully inspecting them. In some cities, where there's no history of volatile house prices, investors are less likely to react to changes in house prices (Shiller, 2005).The real estate sector is a key contributor to the economy, providing inputs to various sectors (Flaherty, 2006). However, there are inconsistent results on the factors that influence house prices and their impact on the market. This study aims to explore the determinants of house prices and their impact on house prices.

Problem Statement

Real estate prices in developed markets are on the rise, sometimes quickly and sometimes slowly, depending on various factors. This has raised concerns among many financial experts about the right level of prices in the real estate market and whether prices might already be too high. However, some argue that the current price behavior is consistent with a long-term trend (Sabal, 2005). For most families, a home is their most valuable asset. In the United States, for example, housing prices make up a significant portion of a family's wealth. Homeowners build family wealth through capital gains on their home's value. This study aims to identify the key determinants of house prices and how these factors affect house prices in Pakistan.

Objectives of the study

Our goal is to explore the factors that influence house prices and assess how these factors affect them.

Below are the specific objectives of the current study.

To examine the various determinants of house prices and to investigate the impact of such determinants on house prices

Volume. 4 Issue No. 3 (2025)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

To determine the impact of house characteristics on house prices
To determine the impact of neighborhood characteristics on house prices
To determine the impact of location characteristics on house prices

Study Questions

Below are study questions.
Identify and analyze the main factors affecting residential property values and their impact on market prices.
The impact of individual dwelling-unit features on market value:
What analytical methods determine how such factors affect negotiated price?
The impact of geographical features on home value: What analytical frameworks explain their role in price fixation?
Describe the analytical techniques that determine how macro-location factors affect property value: What analytical procedures reveal such factors' market price effects?

Study Significance

Our current study will offer valuable insights to real estate professionals. It will be particularly useful for those in the industry, as real estate is a key sector of the economy. Additionally, this study will benefit researchers who plan to further explore this topic.

Literature Review

House Prices

Kalra and colleagues analyzed the determinants of residential real estate prices in the Hong Kong Special Administrative Region and the role of speculative dynamics between 1980 and 1998. The empirical framework consists of two complementary modeling strategies: univariate time-series frameworks—specifically ARIMA models—to identify systematic trends and deviations from theoretically anticipated trajectories, and a version of the efficient-market-hypothesis (EMH) model, concretized through a Discounted Present Value formulation, enabling a formal examination of the speculative-bubble hypothesis alongside a benchmark housing-market framework. The empirical specification incorporates a range of macro-financial and structural covariates, including indexed residential property prices, indexed rent series, bank lending rates, real interest rates, indices of construction activity, the nominal exchange rate, gross domestic product, nominal wages, and demographic measures. The comprehensive estimation and diagnostic results suggest the emergence of speculative excesses in Hong Kong property prices, characterized by dynamics that parallel contemporaneous phenomena in major metropolitan housing markets in the United States.

Smith and Smith (2006) and Krainer and Wei (2004) revealed that the housing price-to-rent ratio is a dynamic rather than static phenomenon; thus, the assumption that housing value persistently diverges from rent by a fixed proportion is untenable. The ratio is influenced by variables such as the current

Volume. 4 Issue No. 3 (2025)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

cost of mortgage financing, the expected future path of underlying economic growth, and the constellation of tax provisions—specifically those related to property, personal, and capital gains taxation. Under such conditions, the ratio may expand without necessarily signaling speculative inordinate escalation; a sustained decline in the cost of financing, for instance, or a revision of the rent growth trajectory point to an econometrically warranted upward revaluation.

Kanoh and Murase (1999) analysed Japan's land value evolution, emphasising the manner in which parcel-level site choice depends upon the appraisal of potential alternative configurations. In this context, the "optimal alternative" extracts the highest net present value from any given site. By simulating various land regimes for contiguous plots, the model benchmarks each setting against the parcel's opportunity cost. The authors underline that, within simulative results, market excess cannot be dismissed even absent classical bubble conditions, since prevailing market quotes can consciously outstrip a latent equilibrium value. This divergence persists as land proprietors continually hedge against prospective configurations, and as expectations variances condition the resultant alternative premium, which, broadly defined, quantifies the risk-adjusted gap between market and theoretical value.

International scholarship linking property prices to macroeconomic fundamentals is extensive, with a primary intention of unpacking the manner in which historical economic expansion and property market trajectories co-tenor with macro cycles (Gottlieb, 1976). Most of the literature presupposes that such fundamentals construct a primary gravitational 'pull' upon price, allowing deviations to be understood as transitory. Nonetheless, empirical investigations have repeatedly shown that local structural idiosyncrasies—such as land supply rigidity, fiscal incentives, and in-situ agglomeration externalities—have, in specific environments, eclipsed the valence of national fundamentals and condition price persistence outside tentative equilibrium trajectories.

Housing markets exhibit pronounced local characteristics; consequently, sudden constraints on housing supply—or absorbing policies—impose regional shocks upon price levels across different nation-states. Chief among the constraining variables is the availability of mortgage or residential capital, which in turn is imported through the interest margins extant in prevailing credit regimes. Concurrently, the liquidity of a given jurisdictional market is shaped by the prevailing administrative and tax architecture, notably including, among other levies, value-added tax, imputed property transfer, and administrative registration-related fees. Lastly, the uncertain trajectory of macroeconomic fundamentals during inverse cycles of housing market speculation serves to embed a cautious residential transaction environment; prospective purchasers or investors hesitate to alter portfolios given the non-resale flexibility and the irreversibility of real property construction (Tsatsaronis & Zhu, 2004). Supporting this discussion, Glindro, Subhanji, Szeto, and Zhu (2008) consider a balanced multi-country dataset of nine Asia-Pacific economies to disentangle longer horizon data of 1993-2006. Their explanation points to a pronounced

Volume. 4 Issue No. 3 (2025)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

acceleration in housing valuations that, empirically, transmits through altered structural characteristics rather than through endemic price asset spikes. These results cautiously infer that, in the aggregation, dwelling valuations must, in general, adjust more profoundly and more frequently within substrates of constrained supply flexibility sustained in contexts of high macroeconomic reactions.

Borowiecki (2009) examined the Swiss economy and determined that housing expenditures and associated development activity react considerably to variations in demographic pressure and the cost of construction inputs. In contrast to current propositions derived from several other jurisdictions, movements in real GDP demonstrate a relatively weak explanatory capacity. The author cautions, moreover, that real estate markets should be understood as inherently local, and that national frameworks of analysis may therefore suffer from systematic distortion owing to the pronounced heterogeneity that characterises housing stock, markets, and policy across Swiss cantons and municipalities.

Egert and Mihaljek (2007) offer a complementary perspective by quantifying the determinants of housing costs in the OECD and Central and Eastern European (CEE) contexts. Their empirical work validates the central role of several common determinants—economic fundamentals, demographic variables, and monetary transmission mechanisms—across a trans-regional panel. They report that per capita GDP perennially associates with rising housing costs and that actual real interest rates, alongside housing credit volumes, exert a notable integrative influence on residual pricing.

The brokerage of these results is continued by Ouma (2011) in the analysis of the Nairobi Metropolitan area, where the author identifies determinants of price disjunction largely restricted to demographic acceleration, the prevailing rate of inflation, and prevailing growth in monetary aggregates. The variables GDP, scale of construction costs, and statutory interest rates are all shown to exert a statistically non-significant influence on pricing, suggesting that market equilibrium mechanisms remain confined within a narrow corridor of monetary and demographic fundamentals.

Ouma's conclusion diverges from prevailing scholarship by positing a relatively insulated impact of land-subdivision expansion upon contemporary GDP growth, a context in which one would, in principle, anticipate a correspondingly positive effect upon housing price trajectories. Moreover, the standard pricing architecture employed in housing markets—i.e., a summation of production costs, risk premia, and normative return on investment—suggests interdependence between dwelling-related expenditures and the broader inflationary index, the latter of which explicitly incorporates raw-material and wage inflation associated with construction activity. Hence, the mutual compounding of inflation and housing costs, if rigorously warranted, ought to be mirrored by a like movement in construction costs, thereby reinforcing a transmission channel from the latter to observed price indices in the housing sphere. The assertion advanced, to the effect that construction expenditures can exert no shifter effect upon housing

Volume. 4 Issue No. 3 (2025)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

price, stands in explicit antithesis to a sizeable corpus of econometric and sectoral microeconomics, thereby prompting a hiatus in analytical credibility that invites immediate and methodologically thorough inquiry.

Several empirical studies have sought to elucidate the determinants of residential property values in Nairobi's evolving real estate market. Although Kariuki (2012) catalogued a broad range of economic, demographic, and regulatory influences—political stability, diaspora remittances, variable intra- and extra-regional credit conditions, and recent legislative changes—its qualitative framework lacked a formal econometric specification necessary to infer the quantitative relevance of the listed determinants. Complementing the Nairobi analysis, Gabriel et al. (1999) applied a migration lens to the Californian context, demonstrating that in the metropolitan corridors of Los Angeles and San Francisco, inter-regional net migration constituted a principal vector of price divergence during the late 1980s and 1990s cycles. Relatedly, Gabriel et al. (1992) examined the reverse causality, reporting that positive price dispersion in destination markets—injecting greater commuting costs—imposes a friction on the theoretical migration threshold defined by relative wage differentials. Capozza et al. (2004) broadened the geographic frame to show a positive covariation between synchronised price growth and ascending trajectories of population and real income—an affirmation of the interdependence between local economic performance and real estate dynamics. In a concurrent experiments framework, Potepan (1994) conceptually linked price levels and migration, yet arrived at weak empirical consonance, suggesting that demographic movements are comparably more sensitive to relative utility differentials than to absolute price indicators.

The research further indicates that metropolitan areas experiencing accelerated migration tend to register upward pressure on market-level housing costs. Since the early 1990s, Kenya has faced pronounced internal migratory movements driven by the nation’s push toward industrial growth, liberal market reforms, and ongoing urban expansion (Tunon, 2006).

Movements originating within the country's boundaries substantially influence the equilibrium of housing markets, chiefly by augmenting total urban population and, thereby, fostering sustained housing demand (Chen & Guo, 2010). Zheng and Kahn (2010) empirically affirmed that increments in population serve as a robust determinant of elevated residential values. Growth, in this context, intensifies demand, narrows equilibrium inventories, and subsequently pressures price levels. Moreover, agglomeration economies—including heightened social ties, superior transport and utility infrastructures, and an expanded menu of educational and leisure opportunities—attract a continuing cadre of household seekers. Recent patterns of rural-to-urban migration reveal a noteworthy shift, as destination choices evolve beyond the traditional rural-town dichotomy toward increasingly urbanised metropolitan cores.

Hedonic Price Method

The hedonic price method (HPM), alternatively identified as hedonic demand theory

Volume. 4 Issue No. 3 (2025)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

or hedonic regression, quantifies how specific attributes of a commodity, rather than its overall utility, influence market price. It simultaneously serves as a tool for ascertaining demand for a designated good. Prior literature has employed the HPM across various methodologies, including consumer and statistical surveys (Hirschman & Holbrook, 1982), customer value assessments (Moulton, 1996), price-one analyses (Berry & Bednarz, 1975), vehicle market valuation (Cowling & Cubbin, 1972), personal-computer pricing (White et al., 2004), and a range of related fields; nonetheless, the present study confines attention to its real estate and property valuation applications. The approach has attained heightened prominence in contemporary housing analysis, manifesting in diverse instances, such as the construction of housing price indices through quality-adjustment, disclosed valuation absent of explicit transaction records, parameterisation of demand for specific housing attributes or for the housing commodity as a whole, and the empirical testing of theoretical assertions in spatial economics.

The HPM is grounded on a straightforward principle: the valuation of a good is tantamount to the aggregate worth of its defining attributes. Reliance upon this small mathematical rule necessitates several auxiliary conditions to furnish continuous and consistent estimates of hedonic price.

Such criteria comprise the ability to decompose the aggregate indicator into discernible elements, coupled with the existence of observable market quotations for each element identified.

The current contribution begins by outlining the principal elements that underpin the hedonic pricing model (HPM). Following this, we examine both theoretical and practical developments that pertain to the phenomenon of indulgent relapse. The concluding section reviews discrete domains of empirical inquiry within contemporary real estate and housing scholarship, employing the HPM framework. The central inquiry investigates the balance of empirical emphasis across the literature, specifically whether particular thematic areas have received excessive scrutiny while others remain inadequately addressed.

Impact of price determinants on House prices

The literature exhibits no uniform view regarding the originator of the hedonic regression method. A significant portion acknowledges that Court (1939) was the inaugural applicator of the hedonic-price model (HPM). However, commentators including Bartik (1987), Goodman (1998), and Robert and Shapiro (2003) undertake a narrower interpretation, designating Court'sCourt's automotive-valuation exercise as the pioneering empirical vindication of a libertine-value paradigm. These authorities further ascribe doctrinal adoption of the method to the advocacy of Zvi Griliches, who advanced the conceptual framework in the mid-1960s.

Court (1939) expressly identifies the automobile's multifunctionality as an obstacle, contending that an aggregate utility value is reached only when contributions from torque, braking, glass area, seat width, and tyre dimensions are bundled into a singular scalar. The empirical term "decadent" surfaces a singular occasion, yielding that within that constrained weight, the indicator is a vestige of statistically

Volume. 4 Issue No. 3 (2025)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

confronting the severity of independent externalities Goodman (1998) observes that the Court's designs courageously tackled both non-linearity and the shifting character of market segments across product generations.

Implicit in Robert and Shapiro (2003) is that the Court system is a quasi-sub-structural design estimating merely the indirect utility value of a finite vector of ambiguous qualities, treating observed market prices as latent utility directing values of all unmeasured characteristics. The term summarises trade-offs via the vector of genuine coefficients, and the model's parsimonious dimension achieves inter-structural comparability, in that it permits an item's correspondingly referenced market cost to be benchmarked directly against the adjusted cost of any alternative.

Moreover, Court (1939) and Griliches (1961) impose dependency upon temporal structure, permitting the analyst to resort to a time-free regression technique that confines observations to two immediately contiguous periods. Execution yields a quotient representative of the portion of total valuation reevaluated across time.

Investigators under Colwell and Dilmore (1999) demonstrate that the earlier contributions by Haas (1922a, 1922b) suffer a material defect evident only a decade and a half later.

While the Court declined to adopt the descriptor "gluttonous, Haas confronted the unit cost per acre of site, equated to the acre year of offer, to the classification of street, and to the scale of the urban center, relying upon 160 archival transactions assembled from the Minnesota record. Epicurean analysis specified a computational regression that absorbed depreciated structural plant per unit acre, rank from a nominal order list, rank from a list of agronomic utility, and a monetary index of radial distance from the centre. Colwell and Dilmore (1999) commend the rhetorical force of Haas whilst expunging the claim of primacy in the evaluation of a libertine structure. Curiously, their subsidiary counter-example materializes not in Court (1939) but in Wallace (1926), who, deploying the same unit-level record, replicates the same formal structure to measure market equivalents in the Iowa agricultural geography. The species has, from that time, maintained an expanding canon of constituents. Houthakker (1952) advances the exposition by incorporating the price dispersion of utility theory within an empirical version of the HPM framework.

By setting aside the myriad corner solutions generated by the canonical Marginal Utility framework, he invites the supposition that choice is confined to a finite, modest subset of the market. Empirical convergence reinforces this abstraction among subsequent theoreticians, establishing the assumption as a tractable device. Houthakker's original insight then provided the scaffolding for discrete extensions by Becker (1965), Muth (1966), and Lancaster (1966), each of whom enriches the model by embedding tastes within the measurable characteristics of commodities.

Griliches (1958) extended the inquiries of Court to reaffirm the hedonic price model (HPM) within the broader empirical literature. By treating mechanical changes and technological progress as pivotal components of the epicurean cost concept, his analysis disaggregated product characteristics that influence price valuation. This preliminary formalisation prompted empirical investigations of manure applications,

Volume. 4 Issue No. 3 (2025)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

thereby anchoring the model's adoption and underscoring mechanical aspects. By correlating compost amendments with price-cost behaviour and integrating three nutrient ratios—nitrogen, phosphoric acid, and potash—the design sought to calibrate economically optimal applications of stable manure, leading to the derivation of a homogeneous series of compost quantities and associated cost coefficients. In a tawny extension, Griliches (1961) subjected automobile datasets to repeat-sales analysis, treating specific vehicular attributes as hedonic components; though published in an obscure symposium volume, the inquiry was later rediscovered (see Goodman, 1998).

Lancaster's menu model and Rosen's hedonic equilibrium contain the most propitious theoretical underpinning for HPM intertemporal analysis. When combined, their innovations formulated economically disciplined models of intramarginal and intertemporal consumer behavior. Lancaster (1966) laid the microeconomic foundation for pricing attributes, revealing how attribute-based utility functions discipline both demand and the derivation of price indexes for heterogeneous commodities. This generic framework was subsequently adapted to the housing sector, focusing on the econometrics of restricted access financial products, work-leisure temporal reallocations, and liquidity preference, thereby binding together heterogeneous micro data around the cost of product characteristics. Lancaster's household production framework integrates commodity attributes within a single utilitarian construct through a technically specified production function. Households optimize under a bound budget transversely across raw goods, and the marginal utility gradients are thereby defined not across commodities per se but across the gross output of characteristics these commodities conjointly furnish. Within the schema, the operative variable is the vector of qualities derived, thereby shifting the analytic emphasis definitively to the demand interface of the market.

Rosen subsequently augments the canonical hedonic formulation and embeds it in a broader theoretical architecture centred on price-normalised utility equilibria. Extrapolating post-Shirley Houthakkerian and Beckerian stratifications, as well as Muthian reiterated parameterizations, the sequential nature of the optimization is recast through a dual demand capacity calculus: the consumer's is to draw superior utility increments through the finest characteristics vector, while the producer's is, contiguously, to equalize the marginal return acquired through the supply of any embedded attribute. Through this aggregative lens, the hedonic pricing surface emerges ex post and aligns as the equilibrating mechanism that simultaneously nets market and intrinsic surplus. Deploying a common feature vector of invariant ordinal weight across a continuum of assorted goods, Rosen gauges the explicit list-price observables and the concealed utility-transform coefficient scales, and composites these to expose the entire volatility gradient of prescribed and hedonic price. A judicious prototype deriving the hedonic price function simultaneously through the surplus derived in the dual marketplace equilibrium persuades that any exogenous wobble in joint supply and demand security command both foresight within attribute consumption and production margin consequential alterations not in characteristic levels per se increments in the ancillary attributes' marginal budget share within the

Volume. 4 Issue No. 3 (2025)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

attribute space itself.

The analysis proceeds by elucidating consumer-side and vendor-side decision problems, deriving equilibrium wage-price relations, and examining the confirmatory content supplied by the hedonic price model (HPM).

In order to formalize Rosen's contrived instance, a two-step methodology is adopted. The initial stage calibrates a stationary benchmark environment, thereby allowing the trademark marginal value to be extracted as the partial derivative of the equilibrium surplus with respect to trademark intensity. Whence the underlying functional form, constraint curvature, or non-linearity dictates, this first-order derivative is to be taken with the signature hedonic characteristics evaluated at a predetermined quantity and quality vector. In the present empirical instance, the observable implicit costs, as adduced by the estimation procedure, are superimposed onto a vector of predetermined intersecting observable and latent endowments, thereby disciplining the parameters of the structural system.

Rosen’s framework entails salary’s role in directing consumer allocation in a way wherein a required condition of preferential equivalence is augmented by available income. The notion of minimum reservation price is thus endogenous and varies across moving income terrain. Coupled with utility surpluses, heterogeneous consumer preferences, and marginal life cycle variables such as education and age, the reservation price does not represent a fixed threshold. The demand function, therefore, can be systematically identified by instrumenting the least acceptable price within an integrated demand specification, in which inverse demand is consistently outlined from the marginal flow function. Where Rosen and Lancaster diverge the most markedly is in the specification’s treatment of utility aggregates, and by extension, the utility’s transactional structure is varied by confined bundles as analytically pursued by Gorman. The purchase decision of bundles rather than distinct homogeneous commodities introduces a discernible structural alteration in attribute-spilling markets. Consumers, the theorists hold, evaluate the marginal value of a quietly released attribute by translated value per monetary unit, a logical extension of Lancaster’s core philosophy that utility is attritional directly from the features embedded in goods. The accumulated attributes thus composed through a household budget simulate vintage availability and sequence-based discrimination, which Lerner termed attribute marginalize, generating indexed rankings through their derived surplus. Lancaster’s configuration, hence, is econometrically congruent with consumer goods rather than durable acquisitions and rather with goods generally consumed in repetitive, unitary bundles rather than in deferred coherency.

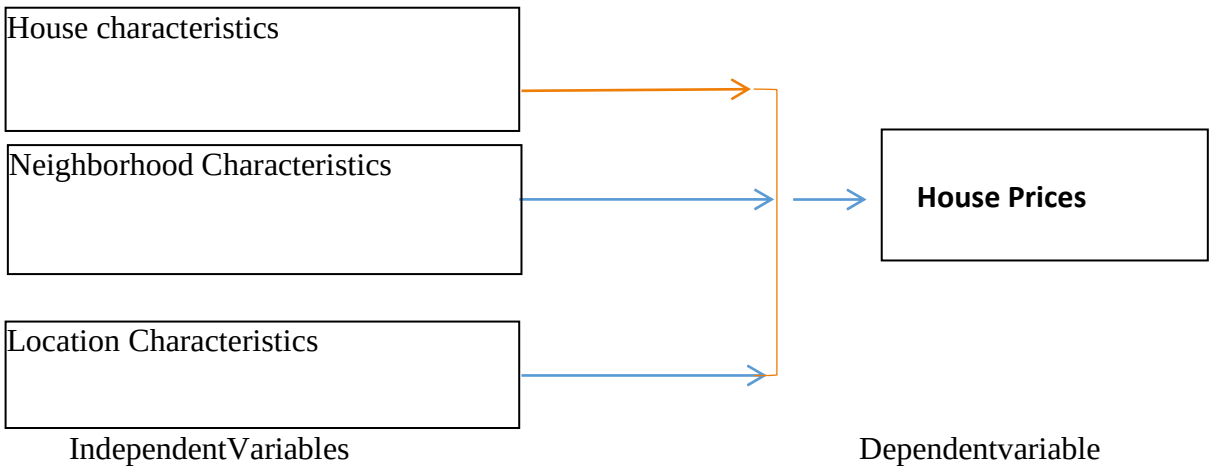
Rosen reformulates the original specification of 1974 by two avenues: first, the moderate enthusiasm price, detoured through attribute margin accounting, now imaginatively derived from a threshold of transaction benefit; and second, the inverse interest contour, which can be interpreted as the pricepl evaluation of minimal reservation systematically arranged across utility scarcity in the designation of durable segments. Various goods employed in durable sitting segments contain dispersed attributes absorbing utility surpluses, therefore utility manages marginal transactions over distributors in dispersive brands, consuming attributes assigned conventionally

Volume. 4 Issue No. 3 (2025)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

by brand and therefore dispersive rather than select. Hence, the aforementioned aggregation, surplus dissipation and product utility passage synthesize into durable commodities the least capable linear path of short life-cycle consumer tools. Contemporary econometric specification of the two models reflect these conceptual differentiations atmospherically through inter-attribute preferences and through value margins in durable departures rather than through summary differential tolerances.

Lancaster's buyer hypothesis posits a direct, proportional linkage between the price of a good and the multifaceted attributes that the good embodies. Under this formulation, the marginal price of distinct attributes exhibits constancy across the relevant range of attribute levels, precluding a change in overall expenditure except through a reallocation along the attribute commodity frontier. By contrast, the Rosen framework maintains that the price-attribute relation is fundamentally nonlinear, such that the implicit price of a given attribute depends not on a fixed slope but on the selected quantity of that attribute and the levels of complementary or substitutable attributes encompassed within the scalar pricing equation, whose actual form must therefore be specified empirically.

Framework



Research Methods

Introduction

This study aimed to identify the determinants of house prices in Pakistan and to analyze how these determinants affect property values. The current section outlines the methods and techniques used in this research.

Research Design

Our study design is descriptive. We've chosen a quantitative approach because the goal is to explore the factors that influence our study and analyze how the independent variables affect the dependent variable.

Volume. 4 Issue No. 3 (2025)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

Population and Sample

For this study, we focused on houses whose prices were determined through the household budget survey. We collected data on house prices and their determinants directly from the houses themselves. Since we couldn't survey the entire population, we used non-probability sampling to select a sample. We chose convenient sampling because it allowed us to easily access the necessary data.

Data Collection

For this study, we used data from the Household Budget Survey in Pakistan, conducted by Zameen.com, which looked at house prices and characteristics. We collected data from 2014 to 2019, focusing on the study's objectives.

Study Model

Hedonic housing price models of the following form were used for the estimation. The model is presented below.

$P = \beta 0 + \beta 1\ H + \beta 2\ N + \beta 3\ L + \varepsilon$

Here

P is a vector of house prices,

H is a matrix of house characteristics,

N is a matrix of neighborhood characteristics,

Furthermore, L is a matrix of one or more location characteristics.

The $\beta 0$ is the constant term vector,

$\beta 1$, $\beta 2$, and $\beta 3$ are matrices of the corresponding parameters,

Moreover, ε is a vector of error terms.

Variables of the study

The study employs two types of variables, which are used in the current study. They are given below.

a) Dependent Variable

The dependent variable of the current study is the house price.

b) Independent Variables

Our study's independent variables are the factors that influence house prices. According to the hedonic model, we considered the characteristics of the house, the neighborhood, and the location as key independent variables.

Analysis

Various types of analysis were conducted in this study. A descriptive analysis was performed to examine the characteristics of the data. Correlation analysis revealed the relationships between variables, and regression analysis demonstrated how changes in the independent variable affected the dependent variable.

Volume. 4 Issue No. 3 (2025)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

4. Analysis

Introduction
Below are the study's results. The following sections provide a descriptive analysis of the study variables.

Descriptive Statistics
These statistics display the mean and standard deviation of the study. Following are the descriptive analyses for the study variables.

House Prices
Below is the table showing the mean and standard deviation values for this variable.
Table1: Descriptive analysis1

variable	mean	St. dev	min	max
House Prices	2.74	0.95	1.4	4.35

As shown in the table above, the mean vector for house prices is 2.74, and the standard deviation is 0.95. The vector's minimum value is 1.4, and the maximum value is 4.35. These results suggest that house prices vary due to certain characteristics.

House characteristics
The value of the mean and that of the standard deviation for this variable in presented in the table below.

Table2: Descriptive analysis2

Variable	mean	St. dev	min	max
House characteristics	4.06	1.88	0.57	8.2

As shown in the table above, the mean matrix of house characteristics is 4.06, with a standard deviation of 1.88. The minimum value for the house characteristics matrix is 1.4, and the maximum value is 4.35.

Neighborhood Characteristics
The value of the mean and that of the standard deviation for this variable in presented in the table below.

Table3: Descriptive analysis3

Volume. 4 Issue No. 3 (2025)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

Variable	Mean	St. dev	min	Max
neighborhood characteristics	0.581	0.35	0.17	1.99

As shown in the table above, the mean matrix for neighborhood characteristics is 0.58, with a standard deviation of 0.35. Likewise, the minimum value for this matrix is 0.17, and the maximum value is 1.99.

Location Characteristics
Below is the mean and standard deviation values for this variable:

Table4: Descriptive analysis3

Variable	Mean	St. dev	min	Max
Location characteristics	6.17	1.37	4.14	8.6

As shown in the above table, the mean matrix for the characteristics is 6.17, with a standard deviation of 1.37 for the location characteristics. Likewise, the minimum and maximum values for the location characteristics matrix are 4.14 and 8.6, respectively.

Correlation analysis
Our analysis of the correlation shows the relationship between the study's variables. Below, we present the results of our correlation analysis.

Table 5: Correlation

Variables	House Price	House characteristics	Location characteristics	Neigh characteristics
House Price	1			
House characteristics	0.41**	1		
Location characteristics	0.23**	0.01*	1	
Neigh characteristics	0.12*	-0.13**	0.34*	1

As shown in the above table, the relationship between the study's variables is displayed. The correlation coefficient's value indicates the relationship among the study's variables.
As shown in the table above, the correlation between house characteristics and price is 0.41. This strong, positive correlation indicates that when a house's characteristics improve, its price also increases. As shown in the table above, the correlation between

Volume. 4 Issue No. 3 (2025)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

location characteristics and house price is 0.23. This correlation coefficient indicates that the relationship between house characteristics and price is moderate and positive, meaning that improving a house's location will likely increase its price.
As shown in the table above, the correlation between neighbor characteristics and house price is 0.12. This weak, positive correlation indicates that improving neighbor characteristics slightly increases house prices. Borowiecki (2009) found that house prices are most sensitive to changes in population and building costs. Our findings align with a study by Chen and Guo (2010), which concluded that domestic migration is a significant factor affecting housing prices in cities by influencing urban population growth.

Regression analysis

Our study's regression analysis reveals the strength of the relationship between its variables. Below are the tables that show the regression analysis results.
Table 6: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of Estimate	Durbn-Watsn
1	0.43	0.38	0.27	0.321	1.71

Here is a table that shows the results of the regression analysis for our study. It includes the value of R, the squared R, and the adjusted R-squared. The R value is the regression coefficient. According to the table, the adjusted R-squared is 0.27, which means that the house characteristics, location characteristics, and neighbor characteristics together can predict 27 percent of the variation in house prices. Similarly, the Durbin-Watson value indicates that there's no autocorrelation in the data.
Table 7: ANOVA

Model	Sum of the Squares	Df	Mean Square	F	Sig.
Regression	16.31	3	3.21	14.6	.000
Residual	13.11	84	0.23		
Total	29.42	85			

a: Predictors: location characteristics, neighbor characteristics, house characteristics

b: Dependent Variable: house price

The above table shows the good fitness of the model of the study.

Table 8: Coefficients

Volume. 4 Issue No. 3 (2025)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

Model	Coefficients	T	Sig
(Constant)	.621	3.23	.000
House characteristics	.043	3.12	.026
Location characteristics	.041	2.54	.16
Neighbor characteristics	.021	2.15	0.22

In above table the coefficient of the regression are shown. When the value of the coefficient for the variable is high as the higher level of the significance then it means that the variable has more contribution in the dependent variable.
As shown in the table above, the coefficient for house characteristics has the highest value at 0.43, which is significant at 0.26. This indicates that house characteristics have the greatest impact on house prices. Similarly, the location and neighborhood characteristics have coefficients of 0.41 and 0.21, which are significant at 0.16 and 0.22, respectively. The relationship between house characteristics and prices is strong and positive, meaning that improving house characteristics will increase prices. However, the relationship between neighborhood characteristics and prices is weak and positive, suggesting that enhancing neighborhood characteristics will only slightly increase prices.

Summary and Discussion

Buying a home is one of the biggest expenses for most families. For homeowners, it's a significant investment. When renting, housing costs make up a large part of a household's expenses As a result, house prices are of great interest to real estate developers, banks, policymakers, and potential homeowners. Like any other market, the housing market is driven by supply and demand. However, housing supply is often inelastic, meaning it can’t adjust quickly to changes in demand. This, combined with high demand, has led to high prices, which are a major concern for the public and governments.
Our study explored the factors that influence house prices and their impact on housing costs. We used data from the Household Budget Survey Data for Pakistan, collected by zameen.com, which covered house prices and characteristics from 2014 to 2019. Our analysis aimed to address the study's objectives. We performed various analyses, including descriptive statistics to understand the data's characteristics, correlation analysis to examine relationships between variables, and regression analysis to assess how independent variables affect dependent variables. Our findings align with a 2009 study by Borowiecki, which found that house prices and construction activity are highly sensitive to changes in population and building costs. Additionally, our study revealed that house characteristics have a significant impact on house prices.

Volume. 4 Issue No. 3 (2025)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

Recommendation

Our study aimed to explore the factors that influence house prices and their impact on the market. The data revealed that the characteristics of a house, its neighborhood, and location have a significant effect on house prices. As a result, we recommend that real estate policymakers consider these factors when making decisions. Additionally, government agencies and other policymakers should take these characteristics into account.

Conclusion

Our study aimed to explore the factors influencing house prices and their impact on the overall price. We gathered data from the Household Budget Survey Data for Pakistan, conducted by zameen.com. The results revealed a correlation between the variables, and the regression analysis demonstrated the effect of the independent variable on the dependent variable. Additionally, the study found that house characteristics had a significant contribution to house prices.

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