

prop tech en bogota colombia, tendencias inmobiliarias en vivienda usada en bogota ultimos tres años , prediccion vivienda usada en bogota, precios vivienda desde diferentes fuentes.

Recent studies in Bogotá demonstrate the increasing use of proptech tools, including machine learning models with 91% accuracy and web scraping techniques, to analyze and predict housing prices across different market segments.

Abstract

Bogotá's housing market studies report mixed trends in property prices and underscore the growing use of digital data techniques. Jaramillo (2004) notes a long-term real decline in housing prices with rising land values and a stronger recovery in high-income segments. Cuervo Ballesteros (2022) finds that average prices climbed from 206 million to 237 million pesos between 1970 and 2012—with spatial price ratios remaining stable between roughly 1:4.7 and 1:4.9. Sanchez and Vega (2015) record price levels in 2014 that exceeded historic highs, with speculative growth in high-income zones. In addition, studies by Calvo (2011), Perdomo (2010), and Perdomo Calvo (2011) report that properties near TransMilenio corridors exhibit about a 13% higher price per square meter.

Digital techniques have been applied to capture recent market shifts. Urrutia Riveros (2020) uses web scraping and mapping tools to show that properties within one kilometer of newly announced metro stations experienced price increases of 5.7% for apartments and 6.9% for houses. Martínez et al. (2021) apply machine learning methods—a Random Forest model that achieves a coefficient of determination near 91% with a 17% coefficient of variation—to predict housing prices. Several studies also indicate that high-income areas tend to show a more speculative price behavior while lower-income sectors reflect demand-driven changes.

Paper search

Using your research question "prop tech en bogota colombia, tendencias inmobiliarias en vivienda usada en bogota ultimos tres años , prediccion vivienda usada en bogota, precios vivienda desde diferentes fuentes.", we searched across over 126 million academic papers from the Semantic Scholar corpus. We retrieved the 50 papers most relevant to the query.

Screening

We screened in papers that met these criteria:

- **Geographic Focus:** Does the study focus on residential real estate specifically within Bogota?
- **Property Type:** Does the study include analysis of used/second-hand residential properties?
- **Data Quality:** Does the study present quantitative price data and market indicators with a clearly described methodology?
- **Source Credibility:** Is the study published by a recognized real estate organization or official source with supporting empirical data?
- **Time Period:** Does the market analysis cover a period of at least 6 months?
- **Technology Focus:** If the study discusses PropTech solutions, are they specifically applicable to Bogota's residential real estate market?
- **Data Sources:** Does the study incorporate price analysis from multiple data sources?

We considered all screening questions together and made a holistic judgement about whether to screen in each paper.

Data extraction

We asked a large language model to extract each data column below from each paper. We gave the model the extraction instructions shown below for each column.

- **Study Design:**

Identify the specific type of research design used in the study. Look in the methods section for explicit description of the research approach. Possible options include:

- Quantitative analysis of property prices
- Econometric modeling
- Time series analysis
- Comparative market analysis

If multiple design elements are present, list all in order of prominence. If the design is not clearly stated, write "Design not explicitly specified" and note any methodological approaches that can be inferred from the text.

- **Geographic Scope and Data Sources:**

Specify the precise geographic boundaries of the study within Bogotá (e.g., specific districts, zones, or city-wide).

Identify and list ALL data sources used in the study, such as:

- DANE (National Statistical Department)
- Real Estate Registry (Lonja de Propiedad Raíz)
- Newspaper property listings
- Government housing databases
- Private real estate databases

For each source, note the type of data collected (e.g., rental prices, property sale prices, land values) and the time period covered.

- **Price Trends and Analysis:**

Extract the key price trend findings, specifically:

- Overall price trajectory (increasing/decreasing/stable)
- Price changes by income segment (low, medium, high-income areas)
- Any identified price anomalies or potential speculative behaviors
- Specific price metrics (e.g., price per square meter, rental yields)

Capture numerical data if available, including:

- Percentage price changes
- Absolute price values
- Time periods of significant price movements

If multiple price trends are discussed, list them in order of significance to the study's conclusions.

- **Factors Influencing Property Values:**

Identify and list all factors discussed as influencing property values in Bogotá, such as:

- Infrastructure development (e.g., TransMilenio stations)
- Government housing policies
- Interest rate changes
- Demand pressures
- Income improvements

For each factor, note:

- How it specifically impacts property values
- The strength of its influence (if quantified)
- Any supporting evidence or statistical analysis provided

Prioritize factors with quantitative evidence over qualitative observations.

- **Study Time Frame:**

Record the exact time period covered by the study:

- Start year
- End year
- Frequency of data collection (annual, semi-annual, etc.)

If the study includes historical analysis, note the full historical range examined.

If multiple time periods are analyzed, list them chronologically with specific dates or ranges.

Results

Characteristics of Included Studies

Study	Study Focus	Geographic Coverage	Time Period	Methodology	Full text retrieved
Jaramillo González and Cuervo Ballesteros, 2014	Long-term housing, rental, and land price trends	Seven areas in Bogotá	1970–2013	Time series analysis, comparative market analysis	No
Jaramillo, 2004	Long-term housing, rental, and land price trends	City-wide Bogotá	1970–2004	Quantitative analysis, time series, comparative market analysis, econometric modeling	No

Study	Study Focus	Geographic Coverage	Time Period	Methodology	Full text retrieved
Urrutia Riveros, 2020	Impact of metro announcement on housing prices	City-wide Bogotá	2019 (Oct)–?	Quantitative analysis, econometric modeling (inferred)	No
Lozano-Gracia and Anselin, 2012	Mass appraisal, spatial heterogeneity in price prediction	City-wide Bogotá	Not specified in abstract	Econometric modeling, quantitative analysis	No
Cuervo Ballesteros, 2022	Spatial price differences, socio-spatial evolution	Seven sectors in Bogotá	1970–2012	Quantitative analysis, time series	Yes
Sanchez and Vega, 2015	Housing bubble detection by market segment	Nine zones in Bogotá	2014	Quantitative analysis, time series	No
Martínez et al., 2021	Machine learning price prediction	City-wide Bogotá	Not specified in abstract	Quantitative analysis, econometric modeling, comparative market analysis	No
Calvo, 2011	Impact of TransMilenio on property values	Suba, Av. Boyacá/Primera de Mayo, Bogotá	2000–2008	Econometric modeling, quantitative analysis, comparative market analysis	Yes
Perdomo, 2010	Impact of TransMilenio on property values	Suba, Av. Boyacá/Primera de Mayo, Bogotá	2000–2009	Econometric modeling, comparative market analysis, quantitative analysis	Yes
Perdomo Calvo, 2011	Impact of TransMilenio on property values	Suba, Av. Boyacá/Primera de Mayo, Bogotá	2000–2009	Econometric modeling, quantitative analysis	Yes

Study Focus:

- Long-term price trends:2 studies addressed long-term housing, rental, and land price trends.
- Transit/transport impact:4 studies examined the impact of transit or transport projects (metro or TransMilenio) on property values.
- Price prediction/mass appraisal:2 studies focused on price prediction or mass appraisal, including one using machine learning.
- Spatial price differences:1 study analyzed spatial price differences and socio-spatial evolution.
- Housing bubble detection:1 study focused on housing bubble detection by market segment.

Geographic Coverage:

- City-wide Bogotá:4 studies.
- Multiple sectors/zones:3 studies (7 or 9 areas).
- Specific corridors/areas:3 studies (Suba, Av. Boyacá/Primera de Mayo).
- Other areas:We did not find mention of geographic coverage for studies outside these areas.

Time Period:

- Long-term periods (10 years):3 studies (ranging from 34 to 43 years).
- Short-term periods (<10 years):4 studies (ranging from 8 to 9 years or a single year).
- Time period not mentioned:3 studies.

Methodology (studies may use multiple methods):

- Quantitative analysis:9 studies.
- Time series analysis:4 studies.
- Comparative market analysis:5 studies.
- Econometric modeling:7 studies.
- Machine learning:1 study.
- Spatial analysis (inferred):1 study.
- Methodology information:Available for all studies.

Effects

Market Price Analysis

Historical Price Trends

Study	Main Price Trend Findings
Jaramillo González and Cuervo Ballesteros, 2014	Presents rental, sale, and land price data (1970–2013) for three income segments; no explicit trend direction found in the abstract.
Jaramillo, 2004	Reports a long-term real decline in housing prices, increase in land prices, decrease in rental yields, and recent recovery in high-income segments (from the abstract).

Study	Main Price Trend Findings
Cuervo Ballesteros, 2022	Finds stable spatial price differences; average price rose from 206 million (1970) to 237 million pesos (2012); price ratio between most/least expensive sectors stable (1:4.7 to 1:4.9).
Sanchez and Vega, 2015	Reports prices increased in 2014, surpassing historic highs; speculative growth in high-income zones, demand-driven in low-income (from the abstract).
Lozano-Gracia and Anselin, 2012	No explicit trend found in the abstract; overprediction of values, with model performance varying by socioeconomic stratum.
Martínez et al., 2021	No explicit trend found in the abstract; focus on prediction accuracy.
Calvo, 2011	Properties near TransMilenio increased in value; 13% higher price per square meter; absolute premium of approximately 115,403 (2008).
Perdomo, 2010	Properties near TransMilenio increased in value by 5.8–17%; premium of approximately 115,403; price per square meter 1,002,065 (with access) vs 886,662 (without).
Perdomo Calvo, 2011	Similar to above; 13% price difference per square meter; 47 per square meter decrease per meter from station.
Urrutia Riveros, 2020	Metro announcement (2019) led to 5.7% (apartments) and 6.9% (houses) price increases within 1 kilometer of stations.

Summary of Findings:

- Observed price increases: 6 studies (Cuervo Ballesteros, 2022; Sanchez and Vega, 2015; Calvo, 2011; Perdomo, 2010; Perdomo Calvo, 2011; Urrutia Riveros, 2020) reported observed price increases.
- Complex patterns: 1 study (Jaramillo, 2004) reported a long-term real decline in housing prices, increase in land prices, decrease in rental yields, and recent recovery in high-income segments.
- Transport infrastructure effects: 4 studies (Calvo, 2011; Perdomo, 2010; Perdomo Calvo, 2011; Urrutia Riveros, 2020) found price premiums or increases associated with proximity to major transport infrastructure (TransMilenio or Metro).
- Spatial price differences: 5 studies (Jaramillo González and Cuervo Ballesteros, 2014; Jaramillo, 2004; Cuervo Ballesteros, 2022; Sanchez and Vega, 2015; Lozano-Gracia and Anselin, 2012) discussed spatial price differences or segmentation by income or area.
- No mention of trend direction or price change: 3 studies (Jaramillo González and Cuervo Ballesteros, 2014; Lozano-Gracia and Anselin, 2012; Martínez et al., 2021) focused on presenting data or prediction/modeling, without mention of explicit trend direction or price change in the available abstracts or full texts.

Recent Market Dynamics (2020–2023)

Zone	Price Variation	Market Volume	Technology Impact
Jaramillo González and Cuervo Ballesteros, 2014	No mention found	No mention found	No mention found
Jaramillo, 2004	No mention found	No mention found	No mention found
Urrutia Riveros, 2020	+5.7% (apartments), +6.9% (houses) within 1 kilometer of metro stations (post-Oct 2019)	No mention found	Use of web scraping, Google Maps, and administrative data
Lozano-Gracia and Anselin, 2012	No mention found	No mention found	Use of Geographic Information Systems for spatial variables
Cuervo Ballesteros, 2022	No mention found	No mention found	No mention found
Sanchez and Vega, 2015	No mention found	No mention found	No mention found
Martínez et al., 2021	No mention found	No mention found	Web scraping (Finca Raiz), machine learning
Calvo, 2011	No mention found	No mention found	No mention found
Perdomo, 2010	No mention found	No mention found	No mention found
Perdomo Calvo, 2011	No mention found	No mention found	No mention found

Key Points:

- Price variation: Only 1 out of 10 studies (Urrutia Riveros, 2020) reported price variation for the recent period, with a +5.7% change for apartments and +6.9% for houses within 1 kilometer of metro stations after October 2019.
- Technology use: 3 studies mentioned technology:
 - Web scraping: Urrutia Riveros, 2020; Martínez et al., 2021
 - Google Maps: Urrutia Riveros, 2020
 - Administrative data: Urrutia Riveros, 2020
 - Geographic Information Systems: Lozano-Gracia and Anselin, 2012
 - Machine learning: Martínez et al., 2021
- Market volume: We did not find mention of market volume in the available abstracts or full texts.

PropTech and Market Evolution

Digital Transaction Platforms

Study	Technology Type	Market Adoption	Price Impact	Prediction Accuracy
Jaramillo González and Cuervo Ballesteros, 2014	No mention found	No mention found	No mention found	No mention found
Jaramillo, 2004	No mention found	No mention found	No mention found	No mention found

Study	Technology Type	Market Adoption	Price Impact	Prediction Accuracy
Urrutia Riveros, 2020	Web scraping, Google Maps	No mention found	+5.7% to +6.9% (metro effect)	No mention found
Lozano-Gracia and Anselin, 2012	Geographic Information Systems, spatial econometrics	No mention found	No mention found	Overprediction; performance varies by stratum
Cuervo Ballesteros, 2022	No mention found	No mention found	No mention found	No mention found
Sanchez and Vega, 2015	No mention found	No mention found	No mention found	No mention found
Martínez et al., 2021	Web scraping (Finca Raíz), machine learning (Random Forest and other algorithms)	No mention found	No mention found	Coefficient of determination (R^2) approximately 91%, coefficient of variation (CV) 17% for Random Forest models
Calvo, 2011	No mention found	No mention found	No mention found	No mention found
Perdomo, 2010	No mention found	No mention found	No mention found	No mention found
Perdomo Calvo, 2011	No mention found	No mention found	No mention found	No mention found

Technology Type:

- No mention found: 7 out of 10 studies.
- Web scraping and Google Maps: 1 study.
- Geographic Information Systems and spatial econometrics: 1 study.
- Web scraping and machine learning: 1 study.

Price Impact:

- Metro effect: 1 study reported a +5.7% to +6.9% price impact associated with the metro announcement.
- Other studies: No mention found.

Prediction Accuracy:

- Overprediction, performance varies by stratum: 1 study.
- Random Forest model: 1 study reported a coefficient of determination (R^2) of approximately 91% and a coefficient of variation (CV) of 17%.
- Other studies: No mention found.

Market Adoption:

- No mention found in the available abstracts or full texts.

Geographic and Socioeconomic Patterns

Zonal Price Variations

Study	Zonal Price Variation Findings
Jaramillo González and Cuervo Ballesteros, 2014	Data for seven areas; three income segments; no explicit trend found in the abstract.
Jaramillo, 2004	Recovery trend strongest in high-income, weaker in low-income (from the abstract).
Cuervo Ballesteros, 2022	Stable price ratios between most/least expensive sectors (1:4.7 to 1:4.9).
Sanchez and Vega, 2015	Speculative growth in high-income zones; demand/aid-driven in low-income (from the abstract).
Lozano-Gracia and Anselin, 2012	Model performance varies by socioeconomic stratum.
Martínez et al., 2021	Dataset segmented by social stratum; no explicit trend found in the abstract.
Calvo, 2011	No mention by zone; focus on proximity to TransMilenio.
Perdomo, 2010	No mention by zone; focus on proximity to TransMilenio.
Perdomo Calvo, 2011	No mention by zone; focus on proximity to TransMilenio.
Urrutia Riveros, 2020	No mention by zone; focus on proximity to metro stations.

Summary of Zonal Variation Findings:

- Analysis by income or social stratum: 6 studies analyzed zonal price variation by income or social stratum.
 - Explicit trends: 4 studies reported explicit trends in zonal price variation (e.g., stronger recovery in high-income zones, stable price ratios, speculative growth in high-income areas, or model performance varying by stratum).
 - Segmentation without explicit trends: 2 studies segmented data by zone or stratum but did not report explicit trends.
- Focus on transit proximity: 4 studies focused on proximity to transit (TransMilenio or metro stations) and did not mention zonal price variation.

Socioeconomic Strata Analysis

- Jaramillo, 2004: Reports that recovery in prices is most pronounced in high-income segments, less so in medium, and weakest in low-income areas.
- Cuervo Ballesteros, 2022: Finds that price differences between sectors are stable, indicating persistent socioeconomic stratification.
- Sanchez and Vega, 2015: Reports that speculation drives high-income zone prices, while demand and government aid drive low-income zone prices.

- Lozano-Gracia and Anselin, 2012: Finds that predictive model performance varies by socioeconomic stratum, suggesting different market dynamics.

Synthesis of Socioeconomic Patterns (as reported by included studies):

- Persistent stratification: Several studies report persistent spatial price differences and stable price ratios between sectors, indicating ongoing socioeconomic stratification in Bogotá's housing market.
- Drivers of price change: High-income areas are reported to be more affected by speculative dynamics, while low-income areas are more influenced by policy and demand-side factors.
- Model performance: Predictive models perform differently across socioeconomic strata, reflecting distinct market behaviors.

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