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The Median Multiple and its Implications for Housing Affordability in Addis Ababa, Ethiopia

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ABSTRACT

Housing affordability has become a critical concern in Addis Ababa due to rapid urbanization, rising housing prices, and limited income growth. This study examines the affordability of housing across sub-cities, focusing on median house prices for villas, apartments, and condominiums, and their relationship to median household income. Data were primary collected from secondary sources, including the Ethiopian Statistical Service, Ministry of Urban and Infrastructure, and World Bank reports, and informal sources**,** including local residents, and housing brokers. Descriptive statistical analysis, including mean, median, standard deviation, coefficient of variation and median multiple, were employed to evaluate price levels, variability, and affordability. The results reveal that housing in Addis Ababa is extremely unaffordable for middle and low income households, particularly in high-demand sub-cities, where median multiples far exceed internationally recommended thresholds. Variability in prices reflects heterogeneity in the housing market. The study highlights the urgent need for targeted policies to expand affordable housing, regulate speculative pricing, and provide accessible housing options for middle-income residents.

Keywords: The Median Multiple, Housing Affordability, Addis Ababa, Urban Housing,

INTRODUCTION

Housing affordability in Addis Ababa has emerged as a critical urban challenge, driven by rapid population growth, limited housing supply, and rising housing costs. According to Center for Affordable Housing Finance, approximately 60% of households rely on rental housing; however, even rental units remain largely unaffordable, with many families spending over 65% of their income on housing-related expenses. Informal and substandard housing is also widespread, with estimates suggesting that 57% to 80% of housing units lack access to basic services such as sanitation and electricity (Haile, 2023).

The city's socio-economic and policy environment further complicates housing affordability. Government initiatives, such as the Integrated Housing Development Program (IHDP), which aim to expand housing for low-income residents, have faced criticism for disproportionately benefiting middle- and upper-income groups (Larsen & Yeshitela, 2021). High land and construction costs, limited infrastructure, and restricted access to housing finance exacerbate the affordability gap, limiting the majority of residents from securing adequate housing (Mulugeta & Worku, 2020; Gebre & Singh, 2022). Consequently, many households either reside in informal settlements or allocate an excessive share of their income to housing (Alemayehu & Assefa, 2019).

Rapid urbanization intensifies these challenges, creating a growing mismatch between housing demand and supply. With a population growth rate exceeding 4% annually, largely fueled by rural-urban migration, the city's housing market struggles to provide affordable options for low- and middle-income households, further expanding informal settlements (UN-Habitat, 2020). Economic factors, such as inflation and rising construction material costs, have increased housing prices, while limited serviced land, high infrastructure costs, and bureaucratic hurdles in land acquisition hinder the production of affordable units (Addis Ababa Urban Planning Bureau, 2019).

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As Ethiopia's political, economic, and cultural hub, Addis Ababa faces a persistent imbalance between housing demand and supply. Rising land and construction costs have outpaced household income growth, making homeownership unattainable for most residents (Mulugeta & Worku, 2020). Informal settlements continue to grow as low-income families resort to substandard housing due to the lack of affordable formal alternatives (Alemayehu & Assefa, 2019). Limited access to housing finance and inadequate infrastructure exacerbate long-term housing insecurity and socio-economic disparities (Gebre & Singh, 2022). Government programs intended to improve affordability have often favored middle-income households, leaving the poorest segments underserved (Tadesse & Teferra, 2021).

Although rental housing plays a dominant role in Addis Ababa and rental cost burdens provide important background context, this study focuses exclusively on ownership affordability. The empirical analysis examines purchase prices of housing units and evaluates affordability using the Median Multiple framework.

The Median Multiple ratio, provides valuable insights into the severity of housing challenges in Addis Ababa and the effectiveness of current policies and programs. Understanding the socio-economic, market, and policy factors influencing housing affordability is crucial for sustainable urban planning and equitable policy development. This study therefore employs the Median Multiple framework to analyze housing affordability in Addis Ababa, aiming to enhance knowledge on urban housing issues and provide practical recommendations for addressing the affordability gap.

LITERATURE REVIEW

Concept Of The Median Multiple

The median multiple is a commonly used measure of housing affordability that compares the price of a typical home to the income of a typical household. It is calculated by dividing the median house price by the median annual household income. This indicator focuses on the middle household, providing a clear picture of housing affordability for a typical family while avoiding distortion from extreme incomes or very high house prices (UN-Habitat, 2011).

Housing affordability is typically interpreted using thresholds: a median multiple of 3 or less is considered affordable, 3–4 moderately unaffordable, 4–5 seriously unaffordable, and above 5 severely unaffordable (Demographia, 2023). The median multiple has been widely used in urban housing studies to compare affordability across cities and over time, offering policymakers and researchers a simple, standardized way to assess the gap between incomes and housing costs (UN-Habitat, 2011)

Across Africa, urban housing affordability is constrained by high population growth, rural-urban migration, and limited housing finance mechanisms (Huchzermeyer, 2011). Cities such as Nairobi, Lagos, and Johannesburg exhibit Median Multiples far exceeding global affordability thresholds, reflecting systemic barriers in land allocation, infrastructure provision, and construction costs. Informal settlements remain widespread, often lacking access to basic services, as formal housing supply fails to meet the growing demand (UN-Habitat, 2020). African studies emphasize the importance of integrating policy interventions, innovative financing, and participatory planning to address affordability gaps.

In Ethiopia, urban housing affordability is a growing policy concern, especially in major cities like Addis Ababa. Studies indicate that rapid population growth, limited housing supply, and escalating construction costs have widened the gap between household incomes and housing prices (Mulugeta & Worku, 2020; Gebre & Singh, 2022). Research also highlights that the majority of low-income households are forced to rely on informal settlements or spend an excessive share of their income on rental housing, exacerbating socioeconomic inequalities (Alemayehu & Assefa, 2019).

The population of Addis Abeba is growing at over 4% annually, with rural-urban migration further intensifying housing demand (UN-Habitat, 2020). Median house prices have risen sharply, often outpacing income growth

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and making homeownership unattainable for most residents (Mulugeta & Worku, 2020). Informal settlements have expanded as low-income households seek substandard housing alternatives, while the limited availability of serviced land, high infrastructure costs, and bureaucratic constraints hinder affordable housing development (Addis Ababa Urban Planning Bureau, 2019). Applying the Median Multiple in this context provides a quantitative lens to assess affordability levels, identify vulnerable groups, and evaluate the effectiveness of current housing policies.

The literature indicates that housing affordability is a multi-dimensional challenge shaped by demographic, economic, and policy factors. While global and African studies provide benchmarks for affordability, Ethiopia and Addis Ababa face unique constraints due to rapid urbanization, limited formal housing supply, and socioeconomic disparities. The Median Multiple serves as a valuable tool for quantifying affordability gaps, guiding policy interventions, and informing sustainable urban planning. This study builds on these insights to analyze housing affordability in Addis Ababa, highlighting socio-economic drivers, market constraints, and policy implications.

Concept of Housing Affordability

Globally, housing affordability is broadly defined as the ability of households to access adequate housing without incurring a disproportionate financial burden. A widely recognized benchmark suggests that households should spend no more than 30% of their gross income on housing costs, including rent or mortgage payments, utilities, and other essential expenses (Stone, 2006; UN-Habitat, 2020). Affordability is not only about cost—it also encompasses access to suitable housing in terms of quality, location, and availability of essential services. In rapidly urbanizing cities worldwide, rising population growth, land scarcity, and escalating construction costs have intensified affordability challenges, particularly for low- and middle-income households. Housing unaffordability often contributes to overcrowding, informal settlements, and socioeconomic inequalities (Angel et al., 2012; UN-Habitat, 2016).

Housing affordability is typically measured in terms of disposable income, with affordable housing defined as costing no more than five times a household's gross annual income. For renters, housing costs should not exceed 30% of gross monthly income (Elshadai Baja, 2017). According to the U.S. Department of Housing and Urban Development (HUD), households spending more than 30% of income on housing are considered cost-burdened, and evaluating the true cost of housing must account for related expenses such as water, electricity, and gas, which are essential for a healthy and livable home.

In the African context, housing affordability faces similar pressures but is further complicated by systemic challenges such as informal land markets, limited mortgage financing, and weak regulatory frameworks. Many African cities experience severe housing shortages, forcing a significant proportion of urban residents into informal settlements (Huchzermeyer, 2009; UN-Habitat, 2014). Studies indicate that in Sub-Saharan Africa, most households spend well above the recommended 30% of income on housing, reflecting both market failures and inadequate public housing provision. Informal and substandard housing is widespread, with limited access to essential services such as water, sanitation, and electricity (UN-Habitat, 2014).

In Ethiopia, housing affordability has emerged as a major urban development concern, particularly in rapidly growing cities. The housing market is characterized by limited formal housing supply, high land and construction costs, and inadequate access to housing finance, disproportionately affecting low- and middle income households (Mulugeta & Worku, 2020; Gebre & Singh, 2022). Government initiatives, such as the Integrated Housing Development Program (IHDP), aim to expand affordable housing, but evidence suggests that these programs often benefit middle- and upper-income groups more than low-income households (Larsen & Yeshitela, 2021). Consequently, many urban residents either allocate an excessive share of their income to housing or live in informal and substandard units (Alemayehu & Assefa, 2019).

Addis Ababa, as Ethiopia's capital and largest city, exemplifies these affordability challenges. Rapid population growth, exceeding 4% annually, coupled with rural-urban migration, has created a severe mismatch

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between housing demand and supply (UN-Habitat, 2020). High land and construction costs, limited infrastructure, and bureaucratic hurdles in land acquisition further constrain the production of affordable housing (Addis Ababa Urban Planning Bureau, 2019). Studies indicate that many households in Addis Ababa spend more than 50% of their income on housing, while informal settlements continue to expand as low income families resort to substandard housing (Gebre & Singh, 2022; Alemayehu & Assefa, 2019). The persistent imbalance between supply and demand, combined with limited access to housing finance, highlights the urgent need for targeted policies and interventions to improve affordability and reduce socio-economic disparities.

In the study area, affordability pressures are particularly acute, with housing costs rising faster than household incomes, especially for low- and middle-income families. This has restricted access to formal housing and contributed to the growth of informal settlements (Gebrehiwot et al., 2019; Desta et al., 2017). The central challenges in Ethiopia's housing sector include the affordability and accessibility gap, driven by high construction costs, limited mortgage financing, and escalating land prices (Lemma & Haile, 2020). Addressing these challenges requires comprehensive strategies that reduce costs, expand financing options, and increase the supply of affordable housing.

Conceptual Framing

This study adopts a pragmatic affordability framework that conceptualizes housing affordability as the relationship between housing costs and household economic resources, combined with spatial inequality across urban housing markets. The primary analytical tools the Median Multiple and descriptive price dispersion measures are widely used in international housing research to assess ownership affordability across locations and housing types.

While broader social theories emphasize housing as a reflection of culture, status, and identity, the present study does not operationalize cultural practices, habitus, life-modes, or social capital as empirical variables. Instead, such perspectives are referenced selectively in the discussion to contextualize how affordability pressures intersect with social stratification and spatial differentiation in Addis Ababa. The analysis itself remains grounded in measurable price–income relationships and cross-sectional variation across sub-cities. Thomas Hojrup, Mary Douglas, a British anthropologist, and Pierre Bourdieu, a French sociologist, wrote theories on housing affordability.

Hojrup's theory can be categorized as a work-based theory. Thomas Hojrup (2003), proposed the concept of life-mode .He claims that cultural-relational dialectics constrain our values and that our values are a consequence of cultural life modes. He aimed to resolve the issue of clashing cultural values when they are brought together. Self-employed life mode, wage earner life mode, and career oriented life mode are the three life styles he introduced. The first mode is self-employed, in which the means of production are owned and housed. As a result, the house serves as both a living and a working environment, with no distinction made between working time and space time. The second mode is wage-earner, in which the home is either viewed as a key recreational location or as a location where important spare-time activities are carried out. The third paradigm is career-oriented, in which the house should ideally reflect personal advancement in terms of position, social prestige, and previous and recent experiences.

Douglas' theory focus on an attitude-based theory. Mary Douglas established four different sub-cultures in her book (Douglas, 1996). These are competition and individualism, isolation and avoidance of social restrictions, equity and negotiation, and hierarchical groups. These subcultures have a direct bearing on how cheap housing conditions can be comprehended and studied. When considering this theory on cheap housing, housing typology in terms of house size, house integration into the neighborhood and community, and overall house image are all key considerations. Mary Douglas's housing affordability theory explores the socio-cultural dimensions of housing affordability, emphasizing the role of social norms, values, and perceptions in shaping individuals' housing choices and experiences. According to Douglas, affordability is not solely determined by

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objective financial metrics but is also influenced by subjective factors such as social status, identity, and cultural expectations

Bourdieu's thesis is a status-based theory. The theory of Pierre Bourdieu, published in 1984, introduced three fundamental terms for comprehending the concept of lifestyle: habitus, position, and distinction (Bourdieu,1984). Past experiences and established preferences, as well as socio-behavioral routines, are referred to as habit. Position refers to what agents have in terms of various types of capital, and he refers to persons and institutions as agents. Bourdieu's theory suggests that access to housing is not solely determined by economic factors but is deeply intertwined with social structures and cultural norms. He argued that individuals' social and cultural capital, such as education, social networks, and inherited wealth, significantly influence their ability to access affordable housing

All of them are intended to have a significant impact on people's perceptions of cheap housing in both physical and social dimensions. As a result, they should be included in any investigation aimed at generating knowledge concerning affordable housing (Ashraf, Salama, 2006).

Factors Affecting Housing Affordability

Housing plays a vital role in the sustainable development of every country, as it is a fundamental need that significantly enhances quality of life. For many individuals, owning a home is a primary goal. However, affordability has become a major barrier to homeownership, particularly in recent years, as housing prices in major cities have risen to unaffordable levels (Ernawati Mustafa Kamal et al., 2016).

Quigley and Raphael (2004) identify two key drivers of housing affordability concerns. First, housing represents the largest single expenditure in the budgets of most individuals and families. Second, many metropolitan areas have experienced significant increases in housing prices and rental costs. They note that the concept of affordability is complex, encompassing multiple issues, including housing prices, quality, income distribution, household borrowing capacity, public policies affecting the housing market, and individual choices regarding how much one is willing to pay for housing.

According to Abt Associates and the NYU Furman Centre (2023), millions of people face housing costs they cannot afford due to four main factors:

1. Incomes for many workers are too low relative to housing costs.
2. Developers often fail to meet the demand for housing among lower- and middle-income households because of profit-driven priorities.
3. Certain government regulations increase production costs and limit overall housing supply.
4. Insufficient government funding, which is critical for addressing housing supply challenges.

Sheeba Chander (2022) further categorizes the factors influencing housing affordability into external and internal factors.

External factors include elements that directly affect housing costs, such as land acquisition expenses, infrastructure development (on-site and off-site), planning and design costs, borrowing rates, and government subsidies.

Internal factors relate to the socio-economic circumstances of households, including household size, family structure, cultural practices, aspirations, employment opportunities, types of occupations, and income and spending patterns. These factors collectively determine an individual’s or family’s ability to afford housing.

Overall, housing affordability is a multifaceted issue shaped by a combination of economic, social, and policyrelated factors. Addressing these challenges requires a comprehensive approach that accounts for both external housing costs and the internal socio-economic realities of households.

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Consequences of Unaffordable Housing

Housing unaffordability produces a wide range of social, economic, and health-related consequences that

undermine household well-being and urban development. Socially, unaffordable housing increases overcrowding, residential instability, and the risk of homelessness, all of which weaken community cohesion and reduce access to essential services (UN-Habitat, 2020). Economically, high housing costs force households to divert income from food, education, transportation, and healthcare, limiting long-term economic mobility and increasing poverty vulnerability (OECD, 2021). In many cities, unaffordability also pushes low- and middle-income residents to peripheral locations, increasing commuting burdens and reducing labor productivity (Glaeser & Gyourko, 2018). Health consequences are similarly severe, as housing stress is associated with mental health problems, chronic disease, and lower overall life satisfaction (Evans, 2019). Overall, the growing burden of unaffordable housing contributes to deeper socio-economic inequalities and spatial segregation within urban areas.

Social Consequences of Unaffordable Housing

Unaffordable housing has deep social repercussions, particularly for low- and middle-income households who are forced to compromise on quality, safety, and stability. When families cannot afford adequate housing, they often resort to overcrowded units, informal settlements, or insecure rental arrangements, all of which increase residential instability and weaken social networks (UN-Habitat, 2020). Frequent moves and unstable living situations disrupt community cohesion, reduce participation in local institutions, and limit access to schools, health services, and social support systems. These challenges are especially severe for children, who experience disrupted schooling and reduced opportunities for social development (Desmond & Gershenson, 2016).

Housing unaffordability also contributes to social exclusion and deepens existing inequalities. As urban housing prices rise, disadvantaged households are pushed into peripheral or marginalized neighborhoods where social services are limited and crime rates are higher (OECD, 2021). This spatial separation reinforces class based segregation, reduces intergroup interactions, and restricts upward mobility. Studies show that households burdened by high housing costs are more likely to experience stress, strained family relationships, and weakened community belonging (Stone, 2006). Ultimately, unaffordable housing erodes social stability and contributes to long-term generational disadvantages.

Economic Consequences of Unaffordable Housing

Housing unaffordability imposes significant economic burdens on households by diverting a large share of income toward rent or mortgage payments, thereby reducing disposable income for essential needs such as food, education, healthcare, and transportation (OECD, 2021). This financial strain increases the probability of indebtedness and limits a family's capacity to save or invest in productive assets. The cost burden also reduces economic resilience, leaving households more vulnerable to income shocks or emergencies. In extreme cases, persistent unaffordability increases the likelihood of default and homelessness, which further disrupts economic participation (Glaeser & Gyourko, 2018).

At the urban and national level, widespread housing unaffordability has negative implications for economic productivity and labor market efficiency. When workers are priced out of central or accessible neighborhoods, commuting times increase, leading to productivity losses and reduced labor force participation (World Bank, 2020). Employers struggle to attract workers to high-cost cities, particularly in critical sectors such as education, health, and public services. Furthermore, high housing costs can deter both domestic and foreign investment as firms consider affordability a key factor when locating operations (Florida, 2017). Thus, unaffordable housing acts as a structural barrier to inclusive economic growth.

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Health Consequences of Unaffordable Housing

Unaffordable housing has profound effects on physical and mental health. Households facing high housing costs are more likely to live in substandard, unsafe, or overcrowded conditions, which expose them to mold, poor ventilation, inadequate sanitation, and other environmental hazards that increase the risk of chronic illness (Evans, 2019). Overcrowding also facilitates the spread of communicable diseases and leads to disturbed sleep, privacy loss, and reduced psychological well-being. Poor-quality housing environments have long been linked to respiratory diseases, cardiovascular problems, and developmental challenges for children (Krieger & Higgins, 2002).

The psychological impact of unaffordable housing is equally significant. Housing stress defined as persistent worry about meeting housing payments—has been strongly associated with anxiety, depression, and reduced life satisfaction (Bentley et al., 2016). Families struggling to pay rent or mortgages often experience chronic stress that affects work performance, family relationships, and overall quality of life. Studies show that the mental health impact is most severe among low-income households who face both financial strain and limited access to supportive services (Evans, 2019). In this sense, housing affordability is not only an economic issue but also a major public health concern.

Urban Planning Consequences of Unaffordable Housing

Unaffordable housing reshapes urban spatial patterns by pushing low- and middle-income households to the urban periphery, where land is cheaper but services and employment opportunities are limited. This leads to urban sprawl, longer commuting distances, and increased pressure on transportation systems (UN-Habitat, 2020). Peripheral expansion also results in inefficient land use, higher infrastructure costs, and reduced environmental sustainability as cities struggle to extend water, electricity, roads, and social services to distant areas (Angel et al., 2016). Such growth patterns amplify inequality by separating the poor from economic opportunities.

Housing unaffordability also intensifies socio-spatial segregation, producing fragmented urban structures where the wealthy occupy well-serviced central areas while the poor reside in informal or underserved neighborhoods. This segregation limits social mobility, reduces access to quality education and healthcare, and entrenches economic disparities across generations (Massey & Denton, 1993). Moreover, the lack of affordable housing supply near employment zones increases congestion and carbon emissions, undermining sustainable urban development goals. Over time, these negative planning outcomes hinder efficient city functioning and reduce overall urban competitiveness.

The Median Benchmark and Affordability Denominator

Based on recent data, the average monthly salary in Addis Ababa is approximately 55,000 Ethiopian Birr (Payscale, 2025). This figure reflects earnings across various sectors within the city and is influenced by factors such as industry, education level, and work experience. While the average provides a general overview of income levels, it may not accurately represent the distribution of income across all households, particularly in a context of significant inequality.

In contrast, a study conducted by the International Labour Organization (ILO) in July 2024 reported that the median wage in Ethiopia is 3,000 Birr per month (Addis Standard, 2024). The median wage indicates that half of the working population earns more than this amount, while the other half earns less, providing a more precise measure of central tendency in a country where income distribution is highly skewed. These disparities highlight the importance of considering both average and median income figures when assessing economic conditions and affordability in Addis Ababa. While the average income reflects the overall earnings landscape, the median income gives a clearer picture of what a typical worker earns.

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According to the "Trends in Size and Distribution of Wealth in Addis Ababa" report, which analyses household survey data for the city, the mean monthly household income in Addis Ababa has been reported as approximately 5,395 ETB per month, which corresponds to roughly 64,740 ETB per year. This figure represents the average income across households in the city, acknowledging that the distribution is skewed, with some households earning significantly more or less than the mean (Imis Ethiopia, 2024).

Based on the Ethiopia Socioeconomic Panel Survey (ESPS) 2021/22, the median total household income in Addis Ababa is approximately 41,000 Ethiopian Birr per year, or about 3,417 Birr per month. This estimate is based on data collected from 4,999 households across 438 enumeration areas, offering a comprehensive overview of urban income distribution. (Ethiopian Statistical Service & World Bank, 2023).

The median household income in Addis Ababa is higher than the national average, reflecting the city's role as Ethiopia's economic hub. Nevertheless, income distribution remains unequal, with a significant proportion of households earning below the median, emphasizing the presence of low-income households. Understanding median household income is essential for evaluating housing affordability and the economic well-being of urban residents,41,000birr per year serving as a benchmark for assessing the cost of living and accessibility of housing options across different income groups (Ethiopian Statistical Service & World Bank, 2023; Mekasha, 2025).

Housing affordability in this study is assessed using the explained Median Multiple the primary income benchmark for Addis Ababa. This median income is used as the central reference point for affordability analysis because it reflects the income level of a typical urban household in a highly unequal income distribution.

Given that housing costs in many sub cities often consume a significant portion of household income, low- and middle-income families face considerable financial pressure. High land and construction costs, limited access to mortgage finance, and rapidly rising housing prices exacerbate this challenge, making homeownership unattainable for a large segment of residents (Mulugeta & Worku, 2020; Gebre & Singh, 2022). By comparing median income with prevailing housing costs, policymakers and researchers can identify affordability gaps, prioritize interventions, and design housing programs that better meet the needs of typical urban households in the city.

To acknowledge income heterogeneity, affordability outcomes are interpreted with reference to both lower income and higher-income household segments. While the Median Multiple calculations are anchored on the city-wide median income, the discussion highlights how affordability burdens intensify for households below the median and ease only marginally for households modestly above it. This approach allows the analysis to speak meaningfully to both middle- and low-income households without overstating precision beyond the available income data.

METHODS AND MATERIALS

This study relies primarily on secondary data to compute median house prices and affordability indicators. Official sources including the Ethiopian Statistical Service (ESS), the Ministry of Urban and Infrastructure, and World Bank housing sector reports provided the baseline housing price figures disaggregated by sub-city and property type villa, apartment, and condominium. These officially reported prices form the basis for the median values used in Table 1 and for all Median Multiple calculations.

To complement and contextualize the secondary data, informal price information was collected through consultations with local residents, and housing brokers across all sub-cities of Addis Ababa. These informal data were not used to calculate or adjust the reported medians, but rather served as a plausibility and consistency check, helping to verify whether official price patterns aligned with prevailing market conditions at the time of the study.

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A total of three to five consultations were conducted per sub-city, resulting in 38 interviews overall. Respondents were selected purposively to ensure representation of both market intermediaries (brokers) and housing consumers (residents). Price information was collected between March and June 2024 and focused on reported transaction or asking prices for 1-, 2-, and 3-bedroom units by property type.

To reduce the influence of exaggeration or hearsay, reported prices were cross-checked across multiple respondents within each sub-city. Extreme values that were not corroborated by at least two independent sources were excluded from consideration. Informal data were therefore used solely to validate the direction and relative magnitude of price differences across sub-cities and housing types, rather than as direct quantitative inputs into the affordability calculations.

The analysis employed descriptive statistics, including mean and median prices, to understand central tendencies and typical housing costs for each sub-city and property type. The standard deviation (SD) was calculated for 1, 2, and 3 bedroom units to evaluate the variability in housing prices, with higher SD values indicating greater price dispersion. Affordability was assessed through the Median Multiple, which relates the median house price to the median annual household income. A higher Median Multiple indicates lower affordability, providing a standardized framework to compare sub-cities and property types.

Standard deviation values reported in this study indicate cross-sectional price dispersion across housing unit sizes and types within sub-cities, rather than temporal market volatility. As the analysis is based on a single period dataset, variation reflects heterogeneity in housing characteristics and location rather than price change over time.

RESULTS

The analysis focuses on variations in housing prices across different property types (villa, apartment, condominium) and bedroom numbers (1, 2, and 3-bed units), using descriptive statistics such as mean, median, and the sub-city-level median multiple to assess affordability relative to the median annual household income. The results highlight patterns of price distribution, differences between sub-cities, and the relative accessibility of housing for middle- and low-income households. These findings provide the foundation for understanding the challenges and dynamics of housing affordability within the city and guide further discussion on policy implications and potential interventions.

Table: 1: Average Housing Prices (Million), Variability, and Affordability by Sub-city and Property Type

Sub-city	Property Type	1-Bed	2-Bed	3-Bed	Mean	Median	SD	Median Multiple
Bole	Villa	45.0	55.0	70.0	56.7	55.0	12.5	97.5
	Apartment	30.0	38.0	52.0	40.0	38.0	11.0	
	Condominium	22.5	27.0	50.5	33.3	27.0	14.6	
Yeka	Villa	35.0	45.0	60.0	46.7	45.0	12.5	45.1
	Apartment	27.0	34.0	48.0	36.3	34.0	11.3	
	Condominium	20.5	26.0	42.0	29.5	26.0	11.6	
Nifas Silk-Lafto	Villa	28.0	38.0	50.0	38.7	38.0	11.0	36.6
	Apartment	20.0	27.0	37.0	28.0	27.0	8.5	
	Condominium	12.0	17.5	33.0	20.8	17.5	10.4	

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Lideta	Villa	20.0	28.0	36.0	28.0	28.0	8.0	42.7
	Apartment	14.0	20.0	28.0	20.7	20.0	7.0	
	Condominium	11.0	18.0	26.0	18.3	18.0	7.6	
Arada	Villa	25.0	32.0	40.0	32.3	32.0	7.5	41.5
	Apartment	18.0	24.0	32.0	24.7	24.0	7.0	
	Condominium	11.0	19.0	33.0	21.0	19.0	11.0	
Kolfe Keranio	Villa	15.0	21.0	28.0	21.3	21.0	6.5	31.7
	Apartment	12.0	18.0	25.0	18.3	18.0	6.5	
	Condominium	9.0	15.0	22.0	15.3	15.0	6.5	
Akaki Kality	Villa	12.0	18.0	24.0	18.0	18.0	6.0	29.3
	Apartment	10.0	15.0	21.0	15.3	15.0	5.5	
	Condominium	8.0	12.0	18.0	12.7	12.0	5.1	
Gullele	Villa	11.0	17.0	24.0	17.3	17.0	6.5	29.3
	Apartment	10.5	16.0	23.0	16.5	16.0	6.3	
	Condominium	9.0	15.0	22.0	15.3	15.0	6.5	
Addis Ketema	Villa	11.0	16.0	20.0	15.7	16.0	4.5	26.8
	Apartment	9.0	13.0	18.0	13.3	13.0	4.5	
	Condominium	7.0	10.0	16.0	11.0	10.0	4.5	
Lemi kura	Villa	45.0	55.0.	70.0	56.7	55.0	12.5	53.7
	appartmet	30.0	38.0	52.0	40.0	38.0	11.0	
	Condominium	22.5	27.0	50.5	33.3	27.0	14.6	

Table 2: Mean, Median, and SD by Property Type

Property Type	**Mean of Means (ETB '000)**	**Mean Median**	**Mean SD**
Villa	33.74	33.9	10.1
Apartment	25.51	25.8	8.7
Condominium	21.95	21.2	8.3

Villas represent the most expensive housing category and show the highest level of price dispersion reflecting wide variation in costs. In contrast condominiums are relatively the least expensive option and demonstrate less variation across market.

Table3: Price Ranges by Sub-City

Sub-City	**Villa (Max-Min)**	**Apartment (Max-Min)**	**Condominium (Max-Min)**
Bole	25	22	28

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Yeka	25	21	21.5
Nifas Silk-Lafto	22	17	21
Lideta	16	14	15
Arada	15	14	22
Kolfe Keranio	13	13	13
Akaki Kality	12	11	10
Gullele	13	12.5	13
Addis Ketema	9	9	9
Lemi Kura	25	22	28

High-end sub-cities (Bole, Lemi Kura) exhibit the widest price ranges, reflecting greater market and pronounced variation in property values. In contrast Peripheral sub-cities tend to show narrower ranges indicating more uniform pricing and relatively stable market conditions.

Table 4: Coefficient of Variation (CV)

Property Type	**Mean CV (%)**
Villa	29.9
Apartment	34.1
Condominium	37.8

Condominiums have higher relative variability compared to Villas, meaning their prices fluctuate more in percentage terms**,** even though their absolute prices are lower. This indicates that while villas may have higher overall costs, the proportional prices changes for condominiums are more pronounced, reflecting greater relative volatility in the market

Table 5: Comparative Sub-City Clusters

Cluster	Sub-city	Price
High End	Bole, Lemi Kura	Very High
Middle range	Yeka, Lideta, Arada	High
Low end	Kolfe Keranio, Akaki Kality, Gullele, Addis Ketema	Moderate

The sub-cities of Addis Ababa can be grouped into three comparative clusters based on housing prices and affordability. The high-end cluster, including Bole and Lemi Kura, has high housing very high price, making them very unaffordable for most households. The middle-range cluster, comprising Yeka, Lideta, and Arada, features high price making unaffordable. Finally, the low-end cluster, which includes Kolfe Keranio, Akaki Kality, Gullele, and Addis Ketema, are moderate price but remains unaffordable for a significant portion of residents. This clustering highlights the spatial variation of housing affordability across the city and provides insight into areas that are more or less accessible to households with median income levels.

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Graphical Insights

Figure 1: Housing price distribution by sub-city and property type

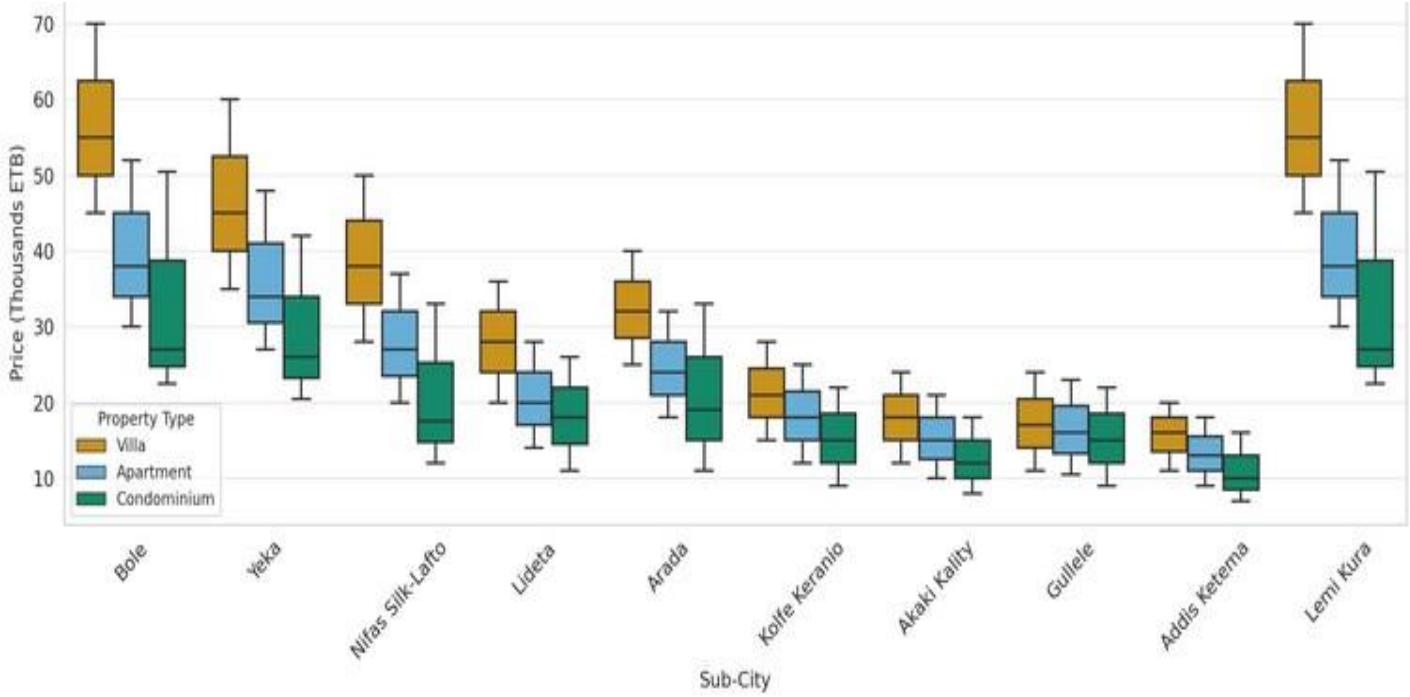
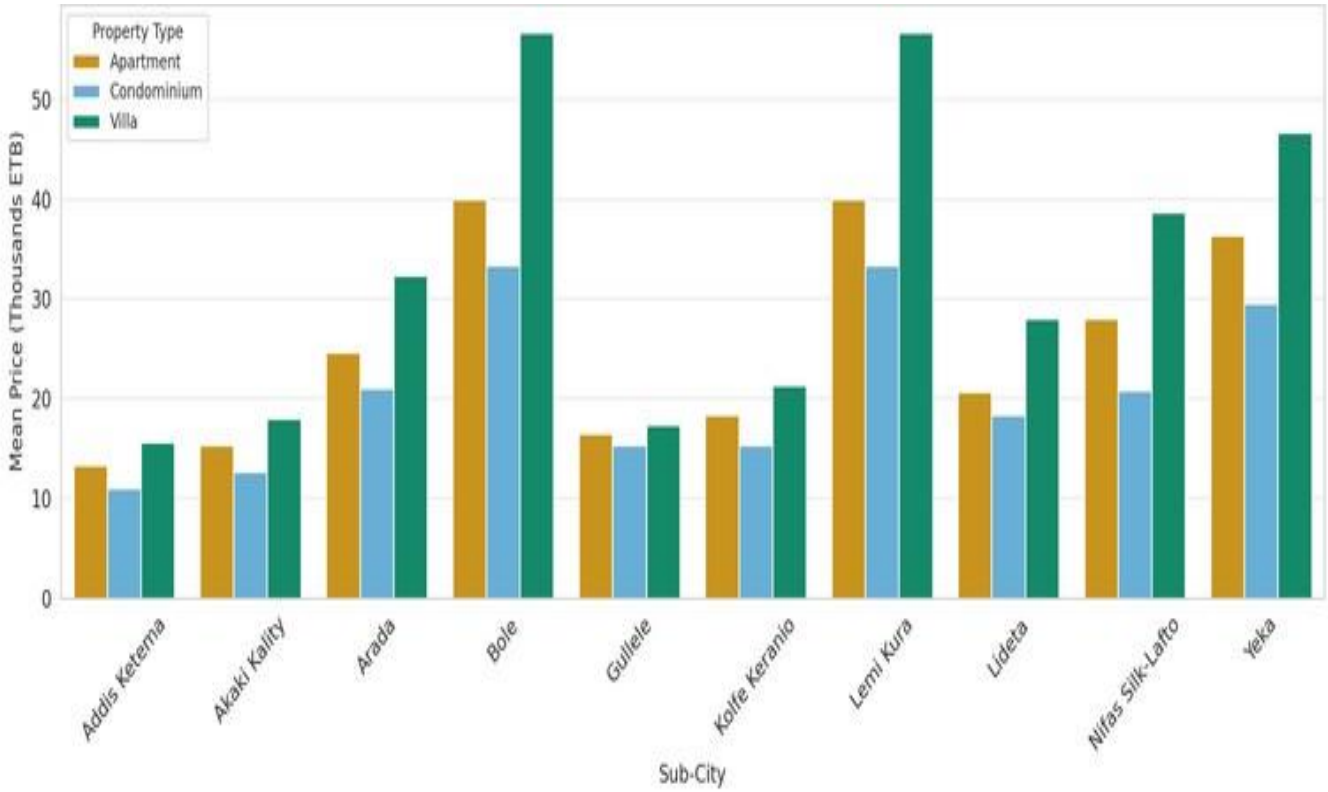


Figure 2: Mean Housing price by property types



DISCUSSION

The result provides a comprehensive overview of housing prices across Addis Ababa, disaggregated by subcity and property type (villa, apartment, condominium), and includes 1-, 2-, and 3-bedroom units**.** The descriptive statistics Mean, Median, and Standard Deviation (SD) alongside the Median Multiple offer a clear picture of housing affordability and price variability within the city.

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Across the sub-cities, Bole consistently shows the highest mean and median prices, particularly for villas, followed by apartments and condominiums. Its Median Multiple indicates that housing in Bole is the least affordable, far exceeding the median annual household income. The high SD values suggest substantial price dispersion, reflecting the presence of both extremely high-end villas and moderately priced condominiums. This variability highlights the heterogeneity of the housing market in Bole and emphasizes that middle and low-income households face limited options for affordable housing.

Sub-cities such as Yeka, Lemi Kura, and Arada occupy a high range of affordability. Villas in these areas remain relatively expensive, while apartments and condominiums offer slightly more accessible options. The SD values in these sub-cities indicate moderate variability, showing that while some units are priced very high, other units remain within a more predictable range, particularly for condominiums.

On the other end of the spectrum, sub-cities like Nifas Silk-Lafto, Kolfe Keranio, Akaki Kality, Gullele, and Addis Ketema present lower mean and median prices and lower Median Multiples , suggesting moderately unaffordable for middle-income households. The SD values in these sub-cities are generally lower, particularly for apartments and condominiums, indicating more uniform pricing and predictability in the market. Villas, while slightly more variable, remain significantly more affordable than high-end villas in Bole or Yeka. The Median Multiple across all sub-cities demonstrates that housing affordability is highly geographically differentiated, with high-end sub-cities catering to upper-income households and low- to middle-income households. Villas are universally the most expensive and variable, apartments occupy a middle tier, and condominiums tend to be the most affordable and consistent in price.

Finally, the relationship between SD and affordability is notable. Sub-cities with higher SD (e.g., Bole, Lemi Kura) indicate a wide dispersion of prices, which can create opportunities for households at the higher end of the income spectrum but limits accessibility for the majority. Sub-cities with lower SD (e.g., Addis Ketema, Gullele) indicate less price variability, meaning households can more reliably anticipate costs and find housing within their means.

The results collected from interviews and consultations with residents and housing brokers closely align with the findings of the quantitative analysis. Reported selling prices for 1-, 2-, and 3-bedroom units across different sub-cities mirror the trends observed in the secondary data, confirming the very high prices and very low affordability in areas such as Bole and Lemi Kura, the high prices in Yeka, Lideta, and Arada, and moderately unaffordable prices in sub-cities like Kolfe Keranio, Akaki Kality, Gullele, and Addis Ketema. This convergence of informal and quantitative data strengthens the reliability of the study's assessment of housing conditions and affordability patterns in Addis Aba.

Overall, this analysis shows that housing affordability in Addis Ababa is highly uneven, influenced by both property type and sub-city location, and that Mean, Median, SD, and Median Multiple are crucial indicators for understanding market dynamics.

CONCLUSION

The analysis of housing prices across the selected sub-cities of Addis Ababa, disaggregated by property type and bedroom numbers, clearly demonstrates tha**t** housing in the city is extremely unaffordable for middle and low-income households**.**

Villas consistently exhibit the highest Median Multiples and price variability, while apartments and condominiums are comparatively more accessible but still largely beyond the reach of average households in the city. The standard deviation (SD) values further highlight disparities in housing prices within each sub-city and property type, indicating that even within more affordable areas, there is a wide range of prices, often leaving lower-priced options limited.

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This situation underscores several important considerations. First, the high Median Multiples reflect a structural imbalance between housing supply and household incomes, emphasizing the need for targeted interventions to expand affordable housing, particularly in fast-growing sub-cities. Second, the variability in prices suggests that policy measures should not only increase supply but also ensure equitable access across different types of housing. Third, middle-income households, who form a substantial portion of the urban population, are disproportionately affected, highlighting the urgency of programs that facilitate homeownership, including subsidized housing schemes, low-interest mortgage access, or incentivized condominium developments.

In conclusion, based on the Median Multiple results and the observed price variability, housing in Addis Ababa is extremely unaffordable, especially in high-demand sub-cities. This calls for concerted policy action to address affordability gaps, regulate speculative pricing, and prioritize housing solutions that align with the incomes and needs of the majority of urban residents. Without such interventions, the city risks exacerbating socio-economic inequalities, pushing homeownership further out of reach, and limiting sustainable urban development.

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