



---

## Value Determinants in Mixed-Income Housing Developments

Dumisani Ndumo<sup>1</sup> and Chioma Okoro\*<sup>1</sup> (<https://orcid.org/0000-0001-5377-6054>)

<sup>1</sup> Department of Finance and Investment Management, College of Business and Economics, University of Johannesburg

**To cite this article:** Ndumo, D. and Okoro, C. (2024) Value Determinants in Mixed-Income Housing Developments. *Journal of African Real Estate Research*, 9(1), pp. 28- 51. DOI: <https://doi.org/10.15641/jarer.v9i1.1394>

---

### Abstract

While some recent studies have focused on the effect of mixed-income housing on property values in surrounding neighbourhoods, there is limited research on the influence of value determinants on different components of value. Understanding the relationship between value components and determinants of value is imperative to attaining sustainable housing in South Africa. The determinants and value components were established from the literature. The relationship between the two variables was evaluated in this study. A questionnaire was used to collect data from 82 participants experienced in valuing property within mixed-income housing developments. Multiple regression analysis showed that neighbourhood determinants significantly influenced monetary value and non-monetary value while environmental determinants had a significant influence on social benefits accruing to other stakeholders in mixed-income housing. As mixed-income housing gains traction in South Africa, the results of this study will serve as development guidelines on critical determinants of value and the extent of their influence on property value in mixed-income housing.

**Keywords:** *mixed-income housing, property value, South Africa, value determinants, value components.*

### 1. Introduction

Mixed-income housing developments are borne out of the government's efforts to provide adequate, subsidized low-cost housing, reduce economic inequality and promote social integration (Klug et al., 2013; Onatu & Baloyi, 2020). However, objections exist regarding developments for

---

\* Corresponding author email address: [chiomao@uj.ac.za](mailto:chiomao@uj.ac.za)

income-diverse groups as it may lead to the erosion of property values in surrounding areas (Simbanegavi & Ijasan, 2017). While studies have examined value concepts in mixed-income housing developments, most have viewed value in terms of market value, forgetting value is broad (de Vries & Vob, 2018; Read & Sanderford, 2017). For instance, low-income earners being integrated into an income-diverse neighbourhood with amenities not ordinarily available to them is a value of its own. Conversely, for high-income earners, factors such as the right resident mix, security, enforcement of rules and efficient waste management systems are benefits sought in the housing market (Vale & Shamsuddin, 2017).

Recent studies have focused on the impact of mixed-income housing developments on the values of properties within the receiving communities (Simbanegavi & Ijasan, 2017). Sturtevant and McClain (2010) found the emergence of mixed-income housing in the Richmond region had a positive social effect on the neighbourhood and property prices. On the other hand, Simbanegavi and Ijasan (2017) found negative impacts on property prices in six neighbourhoods in Cosmo City mixed-income development. In their study, De and Vupru (2017) indicated that value components are as imperative as the value determinants, which may be locational, neighbourhood, structural, socio-economic and environmental.

Although research has been conducted on mixed-income housing, there are limited studies on the relationship between value and mixed-income housing developments. In the performance of the valuation exercise, valuers are faced with an exhaustive list of factors and components. The focus of this study is therefore to establish the relationship between the components of value and factors which influence these components in mixed-income housing developments in South Africa. This study attempts to extend knowledge, from the valuer's perspective, on value components, and factors of value and to evaluate the relationship between the two variables using mixed-income housing developments. Understanding the important value determinants will help to provide sustainable housing and contribute towards achieving Sustainable Development Goal 11. This is critical, as demonstrated by Warren-Myers (2012) and Glover et al. (2017).

### ***1.1 Mixed-income housing development***

A mixed-income development combines low-income and higher-income households in the same development. It is designed to deconcentrate poverty in historically poor neighbourhoods and promote social integration (Onatu & Baloyi, 2020). This is different from social housing, which is accessible to individuals who earn between R1500 and R15 000, and the amount of rent paid must not exceed 30% of the gross income of the tenant (Ludick et al., 2021). One of the aims of mixed-income housing is to integrate low-income earners into more affluent social environments and mainstream economics (Leonard, 2018). However, there are some objections to housing developments for income-diverse groups and there is a perception that they lead to erosion of property values in surrounding areas (Simbanegavi & Ijasan, 2017).

The United States re-organised its efforts towards mixed-income housing in the last two decades of the twentieth century to respond to social problems associated with spatial inequality and concentrated poverty (Schwartz & Tajbakhsh, 1997). Despite the geographic differences, history, economic and population sizes, the United Kingdom (UK) and Australia have followed a similar approach to inclusive housing (Darcy, 2010). Achten and Lessman (2020) add that spatial and economic inequality pose a threat to social order in communities. To rectify spatial and economic

inequality, many countries such as South Africa have introduced inclusionary housing policies (Mkuzo et al., 2019; Sinxadi et al., 2020).

Mixed-income housing programmes and rules have varied across cities and states, based on a range of options and characteristics (migration to the location, development size and types, neighbourhood attributes, race and economic class), the aim of attracting partnerships between developers and the state (Vale & Shamsuddin, 2017; Scheba et al., 2024). Such developments in South Africa include Cosmo City, Lufhereng, Fleurhof and Pennyville in Johannesburg, and Thorntree View in Pretoria. These developments are concentrated in two Gauteng cities due to the relative newness of mixed-income housing in South Africa. The launch of a mixed-use and mixed-income housing development in Cape Town in January 2020 indicates the Western Cape is building more mixed-income housing developments (Scheba et al., 2024). Civil society including legal activists and non-governmental organisations advocates inclusionary housing as a way to mitigate high house prices, burgeoning private investment in upmarket apartments and exclusionary property markets (Scheba et al., 2024). To attract developers, incentives such as rebates and bulk services provision are normally offered to developers in exchange for a defined percentage of housing in the development being reserved for low to middle-income earners (Ellickson, 2009).

Through mixed-income housing, governments can attempt to foster social integration, decentralise poverty and integrate low-income earners into the mainstream economy (Levy et al., 2013; Morare & Sikota, 2014). The urban structure affects the welfare, human interaction and social integration among the citizenry, and the productivity, long-term viability and resources flow through the city, and thus the ecological footprint (SA Cities, 2011). Progress and sustainability in cities and the built environment are actually assured in physical terms, such as the number of new houses built, and the number of households provided with essential infrastructure and services and enjoyed by income-diverse groups. The built form of cities with a mix of people earning different incomes is particularly relevant to South African cities given the distortions inherited from apartheid.

### **1.2 Related Research**

Studies have focused on the impact of mixed-income housing developments on the values of properties within the receiving communities (Sturtevant & McClain, 2010; Simbanegavi & Ijasan, 2017). Sturtevant and McClain (2010) found the emergence of mixed-income housing in the Richmond region had a positive social effect on the neighbourhood and property prices. However, Simbanegavi and Ijasan (2017) found that mixed-income housing developments had a negative impact on the selling prices in six out of seven neighbourhoods surrounding Cosmo City. According to Simbanegavi and Ijasan (2017), the closer the property is to the mixed-income housing development, the greater the negative impact on the selling price. In their study, De and Vupru (2017) indicated that value indicators are as imperative as the value determinants, which may be locational, neighbourhood, structural, socio-economic, and environmental.

The benefits of mixed-income housing have also been studied and theories have been conceptualised on what would ensure these developments are a success (Levy et al., 2013). Researchers have highlighted that a few benefits will be realised across developments (Joseph & Feldman, 2009). These benefits may be monetary or non-monetary depending on the value ascribed to them by different groups of people (developers, property valuers, mixed-income and

culturally diverse users) (Chaskin & Joseph, 2011; Lazano & Escrich, 2017). As the notion of value is extensive it should not be limited to market value (de Vries & Vob, 2018). While property value is a direct benefit to the property owner, the value derived from mixed-income housing is as significant as a quantifiable figure (Read & Sanderford, 2017). For example, low-income earners' integration into an income-diverse neighbourhood with amenities not ordinarily available to them is a value on its own. Conversely, for high-income earners factors such as the right resident mix, security, enforcement of rules and efficient waste management systems are key benefits sought in the housing market (Vale & Shamsuddin, 2017). Also, in the long term mixed-income developments may experience an increase in value because of safety, enforcement of rules, good amenities and services associated with a rejuvenated neighbourhood (Chaskin & Joseph, 2011).

In Ludick et al. (2021), transactional data of residential sales for two areas in South Africa were used to measure the value change from the development of medium-density to high-density affordable housing in greenfield areas located adjacent to higher-income neighbourhoods. According to the authors residential property is valued as a heterogeneous product which comprises a bundle of related inherent attributes or characteristics (structural, physical in terms of bedrooms, bathrooms, size, age neighbourhood and locational features) making up the property's price (Woo, 2014). The implicit market price of a property is thus expressed as a function of attributes where buyers and sellers are willing to transact (Ludick et al., 2021). Therefore, for mixed-income developments, the attributes and benefits accruing to users as well as the monetary value ascribable from the buyers' and sellers' viewpoints form the basis of this study. Funderburg and MacDonald (2010) supported this finding in their examination of the valuation effects of the new construction of low-income housing tax credit projects on neighbouring single-family homes in the US. The study used a 1999-2007 panel of neighbours and their matches while controlling for unobserved heterogeneity. They found that concentrating low-income renters in subsidised housing projects has negative consequences for neighbouring property values that might be avoided with tenant income mixing and improved site planning and design. Thus, mixed-income developments have benefits other than monetary, and in performing valuation exercises, valuers are faced with an exhaustive list of indicators of value owing to various components and derivable benefits. Therefore, the sustainability of such developments is important and warrants research.

Although research has been conducted on mixed-income housing, there are limited empirical studies on the relationships between value components and influencing factors in mixed-income housing developments. The focus of this study is therefore to establish the value components and factors which influence these value concepts in mixed-income housing developments, and the extent of this influence.

## **2. Theories of Value**

The valuation theory underpins this study (Warren-Myers, 2012). Value is not inherent in a thing or article by virtue of its creation or existence, instead, value manifests in the minds of participants in the property markets (Abidoye & Chan, 2016). Value can be attached to different types of items and the perceptions of it vary from one market participant to the next (Cha & Borchgrevink, 2019). Other stakeholders have divergent perceptions of what constitutes value in an office building. The developer, as an owner, primarily perceives the value of an office building as a commercial phenomenon. This is because the commercial benefit from the business venture is the leading priority. The office worker who occupies the building on weekdays derives utility value from occupying the building. The state as a non-user of the asset benefits from property taxes derived

from the building. This demonstrates the complexity of value (Turkeli & Schophuizen, 2019; Cherrier et al., 2018).

The theory of value is nonlinear and complex. Value theory aims to explain how exchange value is determined (Pirgmaier, 2021). The theory is fundamental as its understanding is synonymous with economic dynamics. Value may be viewed as an economic expression of belief (Petri, 2017). The belief in what an item is worth. This expression of value based on the beliefs of market participants is called market value (Mooya, 2016). Market value is a monetary expression of value. However, value extends beyond statistical computations to socio-economic value, which is qualitative in nature (Singh et al., 2017). The social value theory establishes that property does not merely affect the users and developers (International Valuation Standards Council (IVSC), 2020), but it also affects the community (Givati, 2014). The effect on a wider group of stakeholders is also complex because stakeholders have divergent perceptions of value. Since the advent of financial reporting, social value has been less reported as opposed to commercial value used for accountability purposes (IVSC, 2020). This creates an impression that asset owners and users are only accountable to stakeholders with direct connection to the asset. However, socio-economic theory has proven that the impact is more widely felt. Countries like the UK have introduced legislation that makes it mandatory to report on 'social value' (Government of the United Kingdom, 2012). This is done to amplify the focus on socio-economic value as an integral branch of value. Further, the IVSC has recognised the absence of an internationally recognised valuation framework for social value, which could potentially result in continued uncertainty, inconsistencies, different approaches and lack of comparability across borders and jurisdictions (IVSC, 2020).

The theorisation on value in this study is based on the view that value is not merely restricted to commercial value (the price at which a product can be sold). This is because an asset in use affects more than its owners and users and has other connotations of value. While the consumer's perception of value is an important determinant, this study aims to expand on the neo-classical definition of value. Value is crystallised into monetary value, non-monetary value and benefits accruing to other stakeholders in the property market.

## **2.1 Value Indicators**

### **2.1.1 Monetary value**

Mixed-income housing developments have an impact on the value of properties within the receiving community (Sinxadi et al., 2020). This value can be monetary. From a developer's perspective, the primary goal of real estate development is to provide economic benefits for stakeholders (Tripathi & Jha, 2018). Measurement of the economic benefit is through determining the value that the development creates for the owners and the users (Morri & Jostov, 2018). However, in contemporary business reporting, reporting on value extends beyond the economic value focus. The development affects the environment and society in which it is erected. This makes it imperative to report on and appraise the impact of the development on the environment and society. When social and environmental value is created by development, it must be reported upon. Similarly, when it is eroded, reporting must be done as an accountability measure (Buallay, 2019). Reporting on a development's performance is also fundamental to its sustainability (Buallay, 2019).

Sustainability is linked to development's coexistence with the environment and the society it serves (Moore-O'Leary et al., 2017). Governments devise policies and offer incentives to developers to ensure that there is compliance with sustainability measures. (Purvis et al., 2019). Sustainability is threatened when economic objectives are not realised (Taliento et al., 2019). However, projects like mixed-income housing have various objectives ranging from economic to social. The measurement of these developments must be multi-layered to ensure that a comprehensive assessment of performance is achieved (Gupta & Racherla, 2018).

A development which provides a section of housing to low-income earning families has multi-layered objectives. The stakeholders also possess diverse views on what constitutes value in such a development (IVSC, 2020). This approach is appropriate due to its multifaceted approach to value, which is an indicator of sustainability (Freudenreich et al., 2020). According to the IVSC (2020), a comprehensive value definition that expands beyond monetary value comprises three elements: monetary benefit to the asset owner, social benefit to the asset users and social benefit to non-asset users. While mixed-income housing benefits users, who may be high- or low-income earning families, it also benefits the developer as the investor or creator of the asset. The developer's benefit is economic in nature. In South Africa, mixed-income housing developments are products of public-private partnerships. The developer normally benefits from the provided bulk services, and sometimes, with the land upon which to erect the development. This prevents the developer from incurring costs for bulk services which may be in the hundreds of millions. In addition, the developer derives a monetary benefit when the project is complete. Un-subsided properties get sold for monetary value and partially subsidised rental properties are rented for commercial value in return.

The above value impacts on communities beyond the monetary sense. Other stakeholders such as neighbourhood businesses and local governments are also affected (Thurber et al., 2018). This amplifies the view that there is a socio-economic value inherent in mixed-income housing developments. This will be discussed in the next section.

### ***2.1.2 Non-monetary value***

The non-monetary value could be derived by asset users and non-users. This is in line with the view that non-monetary benefits derived from property accrue to property owners and other stakeholders. These benefits are a representation of the socio-economic value associated with mixed-income housing developments. Socioeconomics is a broad phenomenon, making it difficult to quantify (Raidén et al., 2019). While the commercial value of the property may be easier to determine, socio-economic value is more challenging (IVSC, 2020). The perception of value is non-linear across various stakeholders. This enforces the view that determining value is a task anchored in assessing the opinions of the e of different groups of stakeholders (Mooya, 2016).

Socioeconomic value is not regulated by the IVSC (IVSC, 2020). There are valuation methods, both traditional and advanced, that determine the value of property, but there is no conventional standard for determining socioeconomic value (Caldwell et al., 2017). However, accountability standards of practice have evolved. There is a requirement for reporting to transcend commercial value and tap into socio-economic value (Mangialardo & Micelli, 2016). As such financial returns are just as important as the benefits derived by the community and all other stakeholders from a

property project (de Vries & Vob, 2018). Socio-economic theory establishes the concept of social value and its impact on stakeholders (Watson et al., 2016).

### ***2.1.3 Non-monetary value accruing to asset owners***

Asset users derive a social benefit from the use of the asset. Higher-earning families buy property in a development with better services and amenities. They may benefit from quality ho use, a healthy environment with reduced pollution and waste management plans, and proximity to economic centres (Vale & Shamsuddin, 2017). In addition, social order which may be enforced by the property manager, may be a benefit. Low-income earning families may derive similar benefits to high-income earning families may benefit from moving into an area they ordinarily would not afford (SA Cities, 2011). The development may provide proximity to opportunities, which may encourage economic participation. Socially, low-income earning families may benefit from socialising with high-earning neighbours who have access to capital for investments. This could potentially lead to the achievement of social integration and upward economic mobility. Therefore, while households choose neighbourhoods based on their sociocultural background or identity, they may also benefit from areas with mixed-income households (Ludick et al., 2021).

### ***2.1.4 Social benefits accruing to other stakeholders***

In mixed-income housing developments, stakeholders including the local government, investors, non-profit staff, businesses and community residents benefit from the development as citizens are provided with housing in affluent neighbourhoods. The receiver of the subsidised home is positioned in geometric proximity to areas with better economies, positive social patterns and integration (Msweli, 2019). Acting potential solution to unemployment and lack of economic participation.

Similarly, businesses may potentially benefit from a higher number of customers and increased human resource capital supply due to the families moving into the neighbourhood. According to Harper (2017), companies, including non-profit organisations are increasingly creating financing solutions and innovative models to attract investors with a long-term hold philosophy, thus availing projects to renters and owners with a range of income. Therefore, mixed-income housing as an asset presents a social benefit to non-users and a long-term feasible and sustainable form of housing provision.

## **3. Factors influencing the value of mixed-income housing developments**

Value represents the performance of an asset. Therefore, a property's value is a measurement of its performance. However, there is limited recent literature on the relationship between value and mixed-income housing. Mixed-income housing developments have an impact on the value of properties within the receiving community (Sinxadi et al., 2020). The social nature of these developments means the value impact extends to other stakeholders. Families who move into the new development are also affected (McCormick et al., 2012). Previous studies have demonstrated the significance of this effect.

Using multiple linear regression, Chin and Husaini (2013) tested a hypothesis which indicated that proximity to a transportation hub created a price premium and indicated the significance of an integrated transport hub for urban planning purposes. In addition, Simbanegavi and Ijasan (2017)

found that Cosmo-City mixed-income housing development had a negative impact on the property values of houses in the surrounding neighbourhoods in the Randburg area, in the City of Johannesburg, Gauteng province.

While studies have investigated the factors of value and residential property (Guan & Peiser, 2018; Sigit et al., 2020) and on mixed-income housing (Vale & Shamsuddin, 2017), there is a gap in the knowledge on the relationship between value components and factors of value. In addition, other aspects of value accruing from such developments are not clear in the existing literature. Therefore, these relationships were investigated in this study with a view to identifying which factors have the most significance.

The broad hypothesis is that certain factors affect the value of mixed-income developments. These factors include locational, neighbourhood, technical, structural and environmental and socio-economic affect property value. These are presented hereunder:

### ***3.1 Locational factors***

#### ***3.1.1 Proximity to schools***

Sah et al. (2016) reported in a study investigating school proximity effects on housing prices in inland regions, there is a 'proximity premium' consistent with houses located close to schools. In a study examining a more holistic list of factors affecting property value, Oloke et al. (2013) found that proximity to a school was one of the leading locational factors of value.

#### ***3.1.2 Proximity to the central business district (CBD)***

The value of property has an inverse relationship with travelled time or the distance to the CBD. In a study investigating the effects of the CBD and other housing features on housing prices, Zou (2015) sampled 180 housing units in China. Other factors were constant, it was discovered that proximity to a CBD is a significant determinant of property value. Inversely, a 1% increase in distance from the CBD recorded a decrease in the property value.

#### ***3.1.3 Proximity of the development to a highway***

Proximity to a highway provides the benefit of reaching one's destination more easily and reducing navigation through unfamiliar routes. Oloke et al.'s (2013) relative importance index study based on various property stakeholders, including valuation firms, landlords and residents, in Lagos, Nigeria revealed that proximity to a highway is one of the leading locational factors of value.

#### ***3.1.4 Proximity to a shopping mall***

Zhang et al. (2019) found a significantly positive relationship between shopping malls and housing prices in Hangzhou, China. Having divided the study area into nine blocks, the authors found that the shopping mall had a great effect on property prices in blocks located closer and the effect was reduced in blocks located farther away from the shopping mall. Using a hedonic analysis of 8,600 property transactions in a comparative analysis, Addae-Dapaah and Lan (2010) found that properties located close to shopping malls recorded higher premiums than those located in areas without shopping malls.



### ***3.1.5 Size of the nearby shopping mall***

The size of a shopping mall is synonymous with access to certain products. Sirpal (1994) examined the variations in price of identical residential properties proximate to shopping malls of different sizes in Florida, USA. Using various models (linear, log-linear and inverse models) the effect of shopping mall size on the values of identical properties located close to shopping malls was assessed. Results based on the log-linear linear model indicated that values of residential properties close to larger shopping malls were higher than those of identical properties located close to smaller or no shopping malls. In a more recent study in China, Zhang et al. (2020a) found that various types of shopping malls had a positive impact on the value of residential, but the impact was not linear when the types of shopping malls were studied separately. Large shopping malls had a more significant impact on properties in the 'non-core' areas of the city while smaller neighbourhood shopping malls had a greater impact on most of the areas in the city.

### ***3.1.6 Proximity to places of worship***

Places of worship are important considerations for some buyers and communities. Brandt et al. (2014) used hedonic price models to examine their effect on the prices of proximate condominiums. Condominiums located between 100m and 200m from the places of worship recorded a 4.8% price premium. Conversely, in Thompson et al. (2012), it was concluded that the place of worship did not have an influence on the values of surrounding properties in Missouri. Using a pre- and post-treatment model, the religions were analysed to determine the effect on post-construction construction. Based on the results, Thompson et al. (2012) concluded that data on the post-completion phase of the project distort the effect of places of worship on property value.

### ***3.1.7 Proximity to the workplace***

In a study examining a variety of factors affecting property values in Malaysia, it was found that the distance to the workplace was one of the significant contributors to property value (Teck-Hong, 2011). Properties situated within a 20-minute travel time to the workplace had a 20.3% premium in comparison to similar properties located within a farther distance.

### ***3.1.8 Proximity to power plant (including nuclear)***

Power plants are major energy sources, and they have great benefits to society. However, they are also sources of negative externalities (Xu & Lin, 2020). In a comparative assessment of property values in American neighbourhoods, Davis (2011) found that houses proximate to power plants recorded 3-7% decreases in their values.

### ***3.1.9 Proximity to a hospital***

Spatially, the appropriate location of hospitals requires more elaborate consideration. Peng and Chiang (2015) found the effects of hospitals' proximity on property prices to be more complex. Distance at various levels showed a non-linear relationship between hospital proximity and property prices. Properties located between 1,000 metres and 1,000 metres away from the hospital recorded higher prices. Properties located between 2 000 metres and 3 000 metres recorded lower prices. This indicates that an appropriately located hospital has a positive effect on the property price given that it is not close to the problem or too far away.

### **3.1.10 Proximity to transportation hubs**

Transportation hubs include taxi ranks, train stations and airports. Proximity to transportation hubs affords convenience to residents. In an Australian study based on the Bus Rapid Transit (BRT), system and property values in Brisbane, the property value was positively affected by the bus system (Zhang et al., 2020b). Using regression analysis, it was found that property values increased by 1 metre for every 100 metres of proximity to the bus stations. When examining the effects of integrated transport hubs as a component of urban planning policy on housing prices in Singapore, Chin and Husaini (2013), found that the two variables were positively correlated.

## **3.2 Neighbourhood factors**

### **3.2.1 Road conditions**

In a study based on examining the effect of road conditions on property values in California, the effect was found to be minimal (Seo et al., 2018). Results based on a hypothetically improved pavement indicated that the relation between the two variables is statistically insignificant and may lead to no increase in property value at all.

### **3.2.2 Safety and Security**

Studying the impact of a sense of security from crime on property values in Brazilian metropolitan areas, Vetter et al. (2013) found that a sense of security had a positive effect on property values; an increase in the standard deviation by one point led to \$750 average increase in property value of each house.

### **3.2.3 Effective drainage and waste management**

In a comprehensive study based on the effect of urban infrastructure on property values, Ajibola et al. (2013) found that an effective drainage and waste management system had a positive effect on property value. While significant factors of value, waste disposal systems and drainage systems ranked fourth and fifth in the ranking table compromising seven factors of value.

## **3.3 Socio-economic factors**

Assessing the influence of the quality of schools on property value, Machin (2011) found that there was a positive correlation between the two variables. Applying an appraisal of literature from different countries, Machin (2011) determined that houses' proximity to quality or high-end schools recorded higher property values and parents demonstrated a strong will to pay a premium associated with quality schools.

Manufacturing factories are key for economic activity and affect property value. However, they possess various negative externalities for the environment. Analysing the effects of industrial sites on property value, de Vor and de Groot (2011) found that they had a negative impact on property values. The impact was found to be dependent on distance and the results indicated that it was localised. The impact was reduced the farther the property was from the industrial site.

## **3.4 Structural and technical factors**

Age, size and condition are some of the most significant structural and technical factors of value. In a more comprehensive study based on compositional and urban effects on residential property

value, Chiaradia and Hillier (2013) found that property size is the most important structural factor followed by age and condition of the property.

With the growing rates of crime in South Africa and other parts of the world, there is a growing attraction to security in households. In a Nigerian study examining the effect of security features on property value and the willingness of prospective buyers to pay for security features, it was found that security is a significant contributor to property value (Osagie & Ilechukwu, 2016). In a quantitative study featuring 124 questionnaire respondents, security arrangements and features were ranked first and second as the leading determinants of property value.

### **3.5 Environmental factors**

Environmental amenities contribute to people's quality of life and liveability, and some property buyers are willing to pay for them. In a comprehensive study based on the valuation of environmental amenities, Sylla et al. (2019) found that proximity to protected areas and green spaces significantly influenced property prices in Portland, considering factors like the density of cities and noise quality. Likewise, Cellmer et al. (2012) found that environmental factors including noise quality, surface bodies, greenery and landscape had a positive impact on property values as they provide ecological benefits like carbon reduction and ecosystem balance (Bonilla-Duarte et al., 2021). These views were supported by Sander et al. (2010) who found that tree cover had a positive effect on value. Using hedonic modelling, data indicated a positive relationship and statistical significance in the tree cover within 100m and 250m ranges. The 100m and 250m ranges also indicated respective increases of 1,371\$1 371 (0.48%) and \$836 (0.29%) in the property price.

Housing susceptible to flooding and other natural disturbances attracts a property discount if known to market participants (Kropp, 2012). Contrarily, with the rise in sea levels, property with adequate elevation is expected to record a price premium. Fromrom investigating the implications of flooding, rising sea levels and other environmental factors affecting the pricing of property, the relation was found to be negative (Fuerst & Warren-Myers, 2019). Expectations of flooding attracted a negative on the property price while sea levels could not be priced accurately.

The above studies acknowledge the effect of various factors on house prices and property value. However, it appears that there is a dearth of literature on the effect of these determinants on the value of mixed-income housing developments, which is the focus of the current study.

## **4. Methodology**

A quantitative research design was adopted to answer the research question in line with the objective of the study (Abidoeye & Chan, 2016). A questionnaire was used to obtain answers which are definitive using a scale and statistical analysis techniques, as would not be possible with qualitative data. A deductive approach is applicable in a quantitative study and may be evaluated through survey data collection (Saunders et al., 2009).

The value concepts and influencers established through literature were used to form Likert scale closed-ended questions in three sections including the demographic aspects, value determinants and value concepts. Responses ranged from 1 = Strongly disagree to 5 = Strongly agree. The questionnaire draft was checked and revised repeatedly by the supervisor and an industry expert

proficient in valuation (Grimm, 2010). The research complied with the code of ethics stipulated by the researchers' institution.

The target population included property valuers (professional, professional associate and candidate valuers) registered with the South African Council for the Property Valuers' Profession (SACPVP) with about 2100 registered valuers (SACPVP, 2018). However, the Protection of Personal Information Act was cited as a deterrent by the council. Purposive sampling was therefore used to include respondents with experience in valuing properties in mixed-income developments (Taherdoost, 2016). It was thus possible to select a representative sample from which inference could be made about the hypothesised relationships. In addition, snowball sampling was used to identify participants from previous acquaintances and firms surveyed, thus enabling access to more respondents with the target characteristics (Naderifar et al., 2017).

The questionnaires were distributed by hand and online (Google form link) in the provinces of Gauteng, KwaZulu-Natal and the Western Cape. These provinces were included because of the snowballing technique. Data was collected over four months. Eighty-two responses were received. The number was low due to the strict participation criteria and the relative newness of mixed-income housing in South Africa. Therefore, valuers based in municipalities with more exposure to mixed-income housing developments were approached to provide reliable responses. For this study, at least 140 respondents were required ( $N = 10 \times m$ , where  $m$  is the number of independent variables in the largest construct) (Pallant, 2020). However, the small sample was acceptable as observed in similar multiple regression analysis research (Kamath & Fan, 2018; Shetty et al., 2020).

Preliminary analyses included checking for multicollinearity, normality, outliers, and sample size adequacy. The reliability of the questionnaire scale was assessed using Cronbach's alpha, with values of the constructs exceeding 0.7 indicating good reliability (Pallant, 2020). Normality and outliers were assessed. The data was non-normally distributed. However, for multiple regression analysis (MRA), the standardised residuals should resemble a normal distribution, especially with small samples, to produce trustworthy effect estimates and 95% confidence intervals (Osbourne, 2013). An examination of the histograms revealed that there were no outliers, and this assumption was met.

Multicollinearity was checked using Pearson's correlation tests between the variables. Pallant (2020) suggests that the coefficients between the variables should not be greater than 0.7 or less than 0.3 for multicollinearity to be excluded. Multicollinearity was also checked using Tolerance ( $> 0.1$ ) and VIF (1-10) scores. Descriptive analysis was then performed to output mean and standard deviation scores. Further, inferential statistics was done using MRA to establish the effect of one variable on another, as opposed to correlation (Huberty, 2003). Multiple R was analysed to assess the statistical significance of the relationship between the value determinants and indicators. The null hypothesis (no relationship) was rejected when  $p < 0.05$ . The R-squared coefficient was used to explain the extent of variance in the dependent variable which is explained by the model comprising five categories of factors of value. The standardised values were assessed (Pallant, 2020). The ANOVA function also showed the levels of variability within the regression model and formed a basis for tests of significance, with the F-statistic (Frost, 2021). The analysis process and use of suitable methods as explained served to enhance the reliability and validity of the study.

## 5. Results

### 5.1 Demographic profile of respondents

The profile of the respondents is presented in Table 1. Most mixed-income housing developments are in the Gauteng province, with 90.2% representation of valuers based in Gauteng municipalities. Their educational qualifications ranged from diplomas to Master's degrees, and 27% had less than 5, and 5-10 years' experience, respectively. Most of them (71%) had conducted more than seven valuations in mixed-income housing developments. Therefore, valuers from different sectors and municipalities, holding various levels of educational qualifications, positions and experience were included leading to a high degree of reliability placed on the data.

**Table 1: Respondents' profile**

Category	Characteristics	Percentage frequency	Category	Characteristics	Percentage frequency
<b>Organisation</b>	Municipalities	49	<b>Position</b>	Senior valuers	33
	Private consultants	35		Graduate and candidate valuers	31
	Mixed categories (corporate and financial services sectors)	7		Other (Valuation assistants and land acquisition negotiators)	10
	Government departments	5		Managers	23
				Head of valuation	3
<b>Location</b>	City of Johannesburg	55	<b>Number of valuations</b>	More than 7	71
	City of Tshwane	21		5 to 7	8
	City of Ekurhuleni	10		2 to 4	3
	Other (eThekweni and the City of Cape Town)	10		Less than 2	17
	Sedibeng and West Rand	4			
<b>Qualification</b>	Honours	50	<b>Experience (years)</b>	Less than 5	27
	National Diplomaaa	18		5-10	27
	Master's	15		11-15	24
	Bachelors	12		More than 15	22
	Other (advanced and postgraduate diplomas)	3			

### 5.2 Preliminary assessment

A normality test using a histogram to examine the skewness indicated that the data was normally distributed. The multicollinearity requirements were met, with Pearson's correlation values

ranging from 0.40 to 0.73, Tolerance values greater than 0 and VIF greater than 1 and well below the cut of 10. The constructs recorded Cronbach’s alpha values greater than 0.8, indicating reliability (monetary value, 0.846, N=8; non-monetary value, 0.863, N=11), social benefits to other stakeholders (0.835, N=7), locational factors (0.863, N=11), neighbourhood factors (0.918, N=9), socio-economic factors (0.917, N=14), structural and technical factors (0.956, N=10), environmental factors (0.885, N=7). The corrected item coefficients were greater than 0.3, indicating a strong correlation with the total score. Collectively, the items in the sub-scales had a strong correlation with the total scores; thus, a high degree of reliability.

**5.3 Multiple regression results**

**5.3.1 Monetary value as a dependent variable**

The R-squared coefficient (0.377) explains the extent of variance in the dependent variable (monetary value) which is explained by the model comprising five factors of value (Table 2). This translates to 37.7% of the monetary value concepts being collectively predicted by location, neighbourhood, socio-economic, technical, structural and environmental factors of value. The model also recorded statistical significance, as shown in Table 3, F (9.180,  $p < .05$ ) indicating that the five independent variables are jointly significant in predicting monetary value.

**Table 2: Model for monetary value**

<b>Model Summary<sup>b</sup></b>				
<b>Model</b>	<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>
1	.614 <sup>a</sup>	0.377	0.336	0.566
a. Predictors: (Constant), ENV, LOC, NEB, STR, SOC				
b. Dependent Variable: MON				

**Table 3: ANOVA results on monetary value**

<b>Model</b>	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Regression	14.701	5	2.940	9.180	.000 <sup>b</sup>
Residual	24.340	76	0.320		
Total	39.041	81			
a. Dependent Variable: MON					
b. Predictors: (Constant), ENV, LOC, NEB, STR, SOC					

When other factors are constant, neighbourhood factors are the most significant predictors of monetary value (Table 4). Neighbourhood factors recorded a standardised beta of 0.345. The confidence interval ranged between 0.043 and 0.609. This indicates that neighbourhood factors predicted 35% of monetary value ( $p = 0.025$ ). Further, results from Pearson’s correlation analysis

supported a significant positive relationship between neighbourhood factors and monetary value ( $r = 0.563$ ,  $p = 0.000$ ).

**Table 4: Coefficients for evaluating the influence of the independent variable**

Model	Unstandardised Coefficients		Standardised Coefficients	T	Sig.	95,0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	1.578	0.397		3.979	0.000	0.788	2.368
LOC	-0.024	0.152	-0.022	-0.160	0.874	-0.326	0.278
NEB	0.326	0.142	0.345	2.291	0.025	0.043	0.609
SOC	0.288	0.160	0.299	1.793	0.077	-0.032	0.607
STR	-0.043	0.123	-0.054	-0.349	0.728	-0.288	0.203
ENV	0.092	0.117	0.108	0.788	0.433	-0.141	0.326

### 5.3.2 Non-monetary value as a dependent variable

The R-squared coefficient (0.414) explains the extent of variance in the dependent variable which is explained by the model comprising the five factors of value (Table 5). This indicates that the proportion of variance in non-monetary value that can be explained by the independent variables (location, neighbourhood, socio-economic, technical, structural and environmental factors) is 41.4%. Further, results showed that the five independent variables are jointly significant in predicting non-monetary value ( $F = 10.740$ ,  $p < .05$ ) (Table 6).

**Table 5: Model summary for non-monetary value**

Model Summary <sup>b</sup>				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.643 <sup>a</sup>	0.414	0.375	0.513
a. Predictors: (Constant), ENV, LOC, NEB, STR, SOC				
b. Dependent Variable: NMV				

**Table 6: ANOVA results on non-monetary value**

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	14.154	5	2.831	10.740	.000 <sup>b</sup>
Residual	20.031	76	0.264		
Total	34.185	81			
a. Dependent Variable: NMV					
b. Predictors: (Constant), ENV, LOC, NEB, STR, SOC					

When other factors are constant, neighbourhood factors are the most significant predictors of non-monetary value. Neighbourhood factors recorded a standardised beta of 0.485 (Table 7). The confidence interval ranged between 0.172 and 0.686. This indicates that neighbourhood factors predicted 49% of the non-monetary value. Pearson’s correlation results also showed a significant positive relationship between neighbourhood factors and non-monetary value ( $r = 0.587$ ,  $p = 0.000$ ).

**Table 7: Coefficients for evaluating the influence of the independent variable**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95,0% Confidence Interval for B	
	B	Std. Error				Beta	Lower Bound
(Constant)	1.237	0.360		3.438	0.001	0.520	1.954
LOC	0.025	0.138	0.024	0.180	0.858	-0.249	0.299
NEB	0.429	0.129	0.485	3.326	0.001	0.172	0.686
SOC	0.190	0.146	0.210	1.302	0.197	-0.100	0.479
STR	-0.195	0.112	-0.263	-1.745	0.085	-0.418	0.028
ENV	0.189	0.106	0.236	1.775	0.080	-0.023	0.400

**5.3.3 Social benefits to other stakeholders as a dependent variable**

The R-squared coefficient (0.432) explains the extent of variance in the dependent variable which is explained by the model comprising the five factors of value (Table 8). This translates to 43.2% of the social benefits accruing to other stakeholders being collectively predicted by location, neighbourhood, socio-economic, technical, structural and environmental factors of value.

Multiple R was analysed to assess the statistical significance of the results. The ANOVA model showed statistical significance ( $F=11.558$ ,  $p < .0005$ ) (Table 9). The five independent variables are jointly significant in predicting social benefits accruing to other stakeholders.

**Table 8: Model summary for social benefits accruing to stakeholders**

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.657 <sup>a</sup>	0.432	0.395	0.498
a. Predictors: (Constant), ENV, LOC, NEB, STR, SOC				
b. Dependent Variable: SOB				



**Table 9: ANOVA results on social benefits accruing to stakeholders**

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	14.320	5	2.864	11.558	.000 <sup>b</sup>
Residual	18.832	76	0.248		
Total	33.152	81			
a. Dependent Variable: SOB					
b. Predictors: (Constant), ENV, LOC, NEB, STR, SOC					

When other factors are constant, environmental factors are the most significant predictors of social benefits accruing to other stakeholders (Table 10). Environmental factors recorded a standard error (0.103) with a standardised beta (0.405). The confidence interval ranged between 0.114 and 0.524. This indicates that 41% of the social benefits accruing to other stakeholders are predicted by environmental factors. Further results indicated a significant positive correlation between environmental factors and SOB ( $r = 0.558$ ,  $p = 0.000$ ).

**Table 10: Coefficients for evaluating the influence of the independent variable**

Model	Unstandardised Coefficients		Standardised Coefficients	T	Sig.	95,0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	1.254	0.349		3.594	0.001	0.559	1.949
LOC	0.167	0.133	0.164	1.251	0.215	-0.099	0.432
NEB	0.113	0.125	0.130	0.902	0.370	-0.136	0.362
SOC	0.270	0.141	0.304	1.913	0.060	-0.011	0.551
STR	-0.208	0.108	-0.284	-1.916	0.059	-0.424	0.008
ENV	0.319	0.103	0.405	3.098	0.003	0.114	0.524

## 6. Discussion of Findings

Based on the findings, the null hypothesis was rejected for the relationships between monetary value and neighbourhood factors, non-monetary value and neighbourhood factors and social benefits accruing to other stakeholders and environmental factors. The five categories of value determinants showed variable influence on the components of value. Neighbourhood factors were significant determinants of monetary and non-monetary value, whereas environmental factors significantly influence social benefits accruing to other stakeholders. In a similar study examining neighbourhood characteristics as predictors of property price in urban areas, 7,000 houses in Italian cities were studied (de Nadai & Lepri, 2018). Vitality and walkability were identified as significant drivers of property price with 20% of the property price, which is a monetary component of value. A property's neighbourhood factors are instrumental in determining economic and social value which are monetary and non-monetary, respectively (de Nadai & Lepri, 2018).

Environmental factors also recorded significance. In a comprehensive study on the effect of environmental amenities on value, Sylla et al. (2019) supported that proximity to environmental amenities has a significant influence on property price. To establish the relationship between neighbourhood characteristics and neighbourhood satisfaction and well-being, Mouratidis (2020) found that neighbourhoods deprived of environmental factors such as air and noise quality and green space experienced a lack of satisfaction while those having access recorded satisfaction. Also, in mixed-income housing developments, a greater economic impact may be felt than in other residential developments with the income-generation opportunities available (Levy et al., 2013). Other factors were not statistically significant, for example, structural factors. It is a valuation principle that the property's structure and technical attributes constitute a larger share of the property's value. However, these findings support literature to the extent of neighbourhood and environmental factors and their influence on value components.

## 7. Conclusion

The objective of this study was to evaluate the relationship between determinants of value and the components of value in mixed-income housing developments in South Africa. Using responses from a questionnaire survey, factors affecting the value of mixed-income housing and their impact in terms of monetary, non-monetary and stakeholder social benefits were examined. Preliminary considerations included tests for normality, reliability of scale and sample size adequacy. The results obtained from evaluating the relationship between considerations of value and the factors of value indicate that the five categories of factors of value are joint predictors of monetary value, non-monetary value and social benefits accruing to other stakeholders. When other factors are constant, neighbourhood factors are the most significant determinants of monetary value and non-monetary value, and environmental factors are the most significant determinants of social benefits accruing to other stakeholders. This research presents an opportunity to acquire a better understanding of the influence of factors on value from different value concepts throughout South Africa. In addition to the factors that influence the value of MIH, the study brings a better understanding of the role of mixed-income housing in the market and society in the context of South African cities. The results of this study could serve as a guideline on determinants of value to consider in the planning stages of mixed-income housing development and to guide prospective buyers on factors to consider when buying property in a mixed-income housing development. This research also presents evidence to inform housing decision-makers and planners to determine if mixed-income housing developments will be sustainable in future. The small sample size is a limitation of the study, thus limiting the generalisability to the entire population. The results should be interpreted with caution and this study should be replicated with a larger sample to confirm the results. Future research could also expand the focus on value to study social value derived from mixed-income housing developments from the residents' perspective, as income-diverse residents may have divergent views on what constitutes value to them, especially social value derivable from residing in mixed-income communities.

## References

- Abidoye, R. B., & Chan, A. P. (2016). Critical determinants of residential property value: Professionals' perspective. *Journal of Facilities Management*, 14(3), 283-300.
- Achten, S., & Lessmann, C. (2020). Spatial inequality, geography and economic activity. *World Development*, 136, Article 105114.

- Addae-Dapaah, K., & Lan, Y. S. (2010, January). Shopping centres and the price of proximate residential properties. Proceedings of the 16th Annual Conference of the Pacific Rim Real Estate Society, 24-27 January, New Zealand.
- Adebayo, P. (2021). Housing policy and the post-apartheid city: A tale of urban exclusion through housing delivery. In Magidimisha-Chipungu, H.H., Chipungu, L. (eds). *Urban Inclusivity in Southern Africa*, pp. 251-272, Springer: Cham.
- Ajibola, M. O., Awodiran, O. O., & Salu-Kosoko, O. (2013). Effects of infrastructure on property values in Unity Estate, Lagos, Nigeria. *International Journal of Economy, Management and Social Sciences*, 2(5), 195-201.
- Bonilla-Duarte, S., Gómez-Valenzuela, V., Vargas-de la Mora, A., & García-García, A. (2021). Urban forest sustainability in residential areas in the city of Santo Domingo. *Forests*, 12(7), Article 884.
- Brandt, S., Maennig, W., & Richter, F. (2014). Do houses of worship affect housing prices? Evidence from Germany. *Growth and Change*, 45(4), 549-570.
- Buallay, A. (2019). Between cost and value: Investigating the effects of sustainability reporting on a firm's performance. *Journal of Applied Accounting Research*, 20(4), 481-496.
- Caldwell, N. D., Roehrich, J. K., & George, G. (2017). Social value creation and relational coordination in public-private collaborations. *Journal of Management Studies*, 54(6), 906-928.
- Cellmer, R., Senetra, A., & Szczepańska, A. (2012). Land value maps of naturally valuable areas. *Geomatics and Environmental Engineering*, 6(3), 15-24.
- Cha, J., & Borchgrevink, C. P. (2019). Customers' perceptions in value and food safety on customer satisfaction and loyalty in restaurant environments: Moderating roles of gender and restaurant types. *Journal of Quality Assurance in Hospitality and Tourism*, 20(2), 143-161.
- Chaskin, R. J., & Joseph, M. L. (2011). Social interaction in mixed-income developments: Relational expectations and emerging reality. *Journal of Urban Affairs*, 33(2), 209-237.
- Cherrier, H., Goswami, P., & Ray, S. (2018). Social entrepreneurship: Creating value in the context of institutional complexity. *Journal of Business Research*, 86, 245-258.
- Chiaradia, A., Hillier, B., Schwander, C., & Barnes, Y. (2013). Compositional and urban form effects on residential property value patterns in Greater London. *Proceedings of the Institution of Civil Engineers-Urban Design and Planning*, 166(3), 176-199.
- Chin, L., & Husaini, N. K. (2013). Impact of integrated transport hubs on house prices in Singapore. *Proceedings of the European Real Estate Society Conference*, 3-6 July, Vienna, Austria.
- Darcy, M. (2010). De-concentration of disadvantage and mixed-income housing: A critical discourse approach. *Housing, Theory and Society*, 27(1), 1-22.
- Davis, L. W., (2011). The effect of power plants on local housing values and rents. *Review of Economics and Statistics*, 93(4), 1391-1402.
- De Nadai, M., & Lepri, B. (2018). The economic value of neighbourhoods: Predicting real estate prices from the urban environment. *Proceedings of the IEEE 5th International Conference on Data Science and Advanced Analytics (DSAA)*, 1-3 October, Turin, Italy.
- De Vor, F., & De Groot, H. L. (2011). The impact of industrial sites on residential property values: A hedonic pricing analysis from the Netherlands. *Regional Studies*, 45(5), 609-623.

- De Vries, W. T., & Vob, W. (2018). Economic versus social values in land and property management: Two sides of the same coin? *Raumforschung und Raumordnung Spatial Research and Planning*, 76(5), 381-394.
- De, U. K., & Vupru, V. (2017). Location and neighbourhood conditions for housing choice and its rental value: Empirical examination in an urban area of North-East India. *International Journal of Housing Markets and Analysis*, 10(4), 519-538.
- Ellickson, R. C. (2009). The false promise of the mixed-income housing project. *University of California Los Angeles (UCLA) Law Review* 57, 983-1021.
- Freudenreich, B., Lüdeke-Freund, F. & Schaltegger, S. (2020). A stakeholder theory perspective on business models: Value creation for sustainability. *Journal of Business Ethics*, 166(1), 3-18.
- Frost, J. (2021). How to interpret the f-test of overall significance in regression analysis. <https://statisticsbyjim.com/regression/interpret-f-test-overall-significance-regression/> Accessed 12 November 2021.
- Fuerst, F., & Warren-Myers, G. (2019). Sea level rise and house price capitalisation. Social Science Research Network (SSRN) [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3359289](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3359289) Accessed 12 November 2021.
- Funderburg, R. & MacDonald, H. (2010). Neighbourhood valuation effects from new construction of low-income housing tax credit projects in Iowa: A natural experiment. *Urban Studies*, 47(8), 1745-1771.
- Givati, Y. (2014). Legal institutions and social values: Theory and evidence from plea bargaining regimes. *Journal of Empirical Legal Studies*, 11(4), 867-893.
- Glover, R. L., Carpenter, A. & Duckworth, R. (2017). Developing inclusive communities: challenges and opportunities for mixed-income housing. *Federal Reserve Bank of Atlanta Community and Economic Development Discussion Paper*, 1-17. <https://www.atlantafed.org/-/media/documents/community-development/publications/discussion-papers/2017/01-developing-inclusive-communities-challenges-and-opportunities-for-mixed-income-housing-2017-06-07.pdf> Accessed 9 November 2020.
- Government of the United Kingdom (2012). Public services (social value) Act 2012. <https://www.legislation.gov.uk/ukpga/2012/3/enacted> Accessed 18 February 2023.
- Grimm, P. (2010). (Ed.). Pretesting a questionnaire. Part 2, Marketing Research, John Wiley & Sons: United States..
- Guan, C., & Peiser, R. B. (2018). Accessibility, urban form, and property value. *Journal of Transport and Land Use*, 11(1), 1057-1080.
- Gupta, S. K., & Racherla, U. S. (2018). Interdependence among dimensions of sustainability: Evidence from the Indian leather industry. *Management of Environmental Quality: An International Journal*, 29(3): 406-415.
- Harper, J. (2017). How mixed-income housing can benefit both communities and investors? <https://urbanland.uli.org/economy-markets-trends/mixed-income-housing-can-benefit-communities-investors/> Accessed 19 February 2023
- Huberty, C. J. (2003). Multiple correlation versus multiple regression. *Educational and Psychological Measurement*, 63(2): 271-278.
- International Valuation Standards Council (2020). *Perspectives Paper: Defining and Estimating 'Social Value'*, IVSC. <https://www.ivsc.org/wp->

[content/uploads/2021/09/Perspectivespaper-SocialValue.docx.pdf](#) Accessed 15 February 2020.

- Joseph, M., & Feldman, J. (2009). Creating and sustaining successful mixed-income communities: Conceptualizing the role of schools. *Education and Urban Society*, 41(6), 623-652.
- Kamath, C., & Fan, Y. J. (2018). Regression with small data sets: A case study using code surrogates in additive manufacturing. *Knowledge and Information Systems*, 57(2), 475-493.
- Klug, N., Rubin, M., & Todes, A. (2013). Inclusionary housing policy: A tool for re-shaping South Africa's spatial legacy? *Journal of Housing and the Built Environment*, 28(4), 667-678.
- Kropp, S. (2012). The influence of flooding on the value of real estate. *Journal of Building Survey, Appraisal & Valuation*, 1(4), 318-324.
- Leonard, K. M. (2018). *Low-Income Households' Perceived Obstacles and Reactions in Obtaining Affordable Housing*. Unpublished Doctoral Thesis. Walden University, United States.
- Levy, D. K., McDade, Z. & Bertumen, K. (2013). Mixed-income living: Anticipated and realized benefits for low-income households. *Cityscape: A Journal of Policy Development and Research*, 15(2), 15-28.
- Lozano, J. F., & Escrich, T. (2017). Cultural diversity in business: A critical reflection on the ideology of tolerance. *Journal of Business Ethics*, 142(4), 679-696.
- Ludick, A., Dyason, D. & Fourie, A. (2021). New affordable housing development and the adjacent housing market response. *South African Journal of Economic and Management Sciences*, 24(1), Article a3637.
- Machin, S. (2011). Houses and schools: Valuation of school quality through the housing market. *Labour Economics*, 18(6), 723-729.
- Mangialardo, A., & Micelli, E. (2016). Social capital and public policies for commons: Bottom-up processes in public real estate property valorization. *Procedia-Social and Behavioral Sciences*, 223, 175-180.
- McCormick, N. J., Joseph, M. L., & Chaskin, R. J. (2012). The new stigma of relocated public housing residents: Challenges to social identity in mixed-income developments. *City & Community*, 11(3), 285-308.
- Mkuzo, T. Z., Mayekiso, T., & Gwandure, C. (2019). An observational examination of houses built under the "Breaking New Ground" housing policy of South Africa. *Ergonomics SA: Journal of the Ergonomics Society of South Africa*, 31(1), 1-16.
- Mooya, M. M. (2016). *Real estate valuation theory*. New York: Springer Books.
- Morare, M., & Sikota, Z. (2014). The housing crisis in South Africa. Briefing Paper 357, July. *The Southern African Catholic Bishops' Institute*, Parliamentary Liaison Office. <https://www.cplo.org.za/wp-content/uploads/2014/02/BP-357-The-Housing-Crisis-in-South-Africa-July-2014.pdf>
- Morri, G. & Jostov, K. (2018). The effect of leverage on the performance of real estate companies: A pan-European post-crisis perspective of EPRA/NAREIT index. *Journal of European Real Estate Research*, 11(3), 284-318.
- Mouratidis, K. (2020). Neighbourhood characteristics, neighbourhood satisfaction, and well-being: The links with neighbourhood deprivation. *Land Use Policy*, 99, Article 104886.
- Msweli, N. N. (2019). Assessing mixed-income housing as a mechanism for social integration: a case study of the Durban Point area. *Unpublished Master's Dissertation*. University of Kwazulu-Natal, South Africa.

- Naderifar, M., Goli, H. & Ghaljaie, F. (2017). Snowball sampling: A purposeful method of sampling in qualitative research. *Strides in Development of Medical Education Journal*, 14(3), Article e67670.
- Oloke, C. O., Simon, R. F., & Adesulu, A. F. (2013). An examination of the factors affecting residential property values in Magodo neighbourhood, Lagos state. *International Journal of Economy, Management and Social Sciences*, 2(8), 639-643.
- Onatu, G., & Baloyi, V. K. (2020). The use of mixed-income housing development to address poverty and inequality, based on Delphi empirical approach: A Case of South Africa. *Journal of Advanced Research in Social Sciences*, 3(3), 62-77.
- Osagie, J. U., & Ilechukwu, V. U. (2016). Residential property value and security features in gated communities. *Journal of Construction Project Management and Innovation*, 6(1), 1601-1619.
- Osbourne, J. W. (2013). Normality of residuals is a continuous variable and does seem to influence the trustworthiness of confidence intervals: A response to, and appreciation of, Williams, Grajales, and Kurkiewicz (2013). *Practical Assessment, Research and Evaluation*, 18(12), 1-9.
- Pallant, J. (2020). *SPSS survival manual: A step-by-step guide to data analysis using IBM SPSS* Routledge: London.
- Peng, T., & Chiang, Y. (2015). The non-linearity of hospitals' proximity on property prices: Experiences from Taipei, Taiwan. *Journal of Property Research*, 32(4), 341-361.
- Petri, F. (2017). The passage of time, capital, and investment in traditional and recent neoclassical value theory. *Oeconomia. History, Methodology, Philosophy*, 7(1), 111-140.
- Pirgmaier, E. (2021). The value of value theory for ecological economics. *Ecological Economics*, 179, 106790.
- Purvis, B., Mao, Y. & Robinson, D. (2019). Three pillars of sustainability: in search of conceptual origins. *Sustainability Science*, 14(3), 681-695.
- Raidén, A., Loosemore, M., King, A., & Gorse, C. A. (2019). *Social value in construction*. Abingdon: Routledge.
- Read, D. C., & Sanderford, D. (2017). Making places and making tradeoffs: Mixed-income housing development in practice. *Journal of Place Management and Development*, 10(5), 461-478.
- SA Cities (2011). The built environment. State of the Cities Report. [https://www.sacities.net/wp-content/uploads/2019/12/chapter3\\_the\\_built\\_environment.pdf](https://www.sacities.net/wp-content/uploads/2019/12/chapter3_the_built_environment.pdf) Accessed 17th February 2023
- Sah, V., Conroy, S. J., & Narwold, A. (2016). Estimating school proximity effects on housing prices: The importance of robust spatial controls in hedonic estimations. *Journal of Real Estate Finance and Economics*, 53(1), 50-76.
- Sander, H., Polasky, S., & Haight, R. G. (2010). The value of urban tree cover: A hedonic property price model in Ramsey and Dakota counties, Minnesota, USA. *Ecological Economics*, 69(8), 1646-1656.
- Saunders, M., Lewis, P. & Thornhill, A. (2009). *Research methods for business students*. London: Pearson Education.
- Scheba, A., Turok, I. & Rubin, M. (2024). Inclusionary housing: A novel approach to building integrated cities. Centre for Affordable Housing Finance in Africa (CAHF). <https://housingfinanceafrica.org/documents/inclusionary-housing-a-novel-approach-to-building-integrated-cities/> Accessed 25 March 2024.

- Schwartz, A., & Tajbakhsh, K. (1997). Mixed-income housing: Unanswered questions. *Cityscape*, 3(2), 71-92.
- Seo, K., Salon, D., Shilling, F., & Kuby, M. (2018). Pavement condition and residential property values: A spatial hedonic price model for Solano County, California. *Public Works Management & Policy*, 23(3), 243-261.
- Shetty, D. V., Rao, B. P., Prakash, C., & Vaibhava, S. (2020). Multiple regression analysis to predict the value of a residential building and to compare with the conventional method values. *Journal of Physics: Conference Series*, 1706(1), Article 012118.
- Sigit, F., Fachrudin, K., & Fachrudin, H. (2020). Analysis of factors affecting property value at residence with cluster concept: case study-j city residence. *Proceedings of the International Conference of Science, Technology, Engineering, Environmental and Ramification Researches (ICOSTEERR 2018)*, 30-31 August, Sumatera Utara, Indonesia.
- Simbanegavi, P., & Ijasa, K. (2017). Attribute-based hedonic price model on the impact of mixed-income using on house price: the case of Cosmo City in Johannesburg. *Proceedings of the African Real Estate Society (AFRES), 13-15 September, Johannesburg, South Africa*.
- Singh, T., Sharma, S., & Nagesh, S. (2017). Socio-economic status scales updated for 2017. *International Journal of Research in Medical Sciences*, 5(7), 3264-3267.
- Sinxadi, L., Awuzie, B., & Haupt, T. (2020). Tackling spatial inequalities through mixed-income housing: A qualitative analysis of stakeholder perceptions. *Proceedings of the 14th International Postgraduate Research Conference*, 16-17 December, Salford, United Kingdom.
- Sirpal, R. (1994). Empirical modelling of the relative impacts of various sizes of shopping centres on the values of surrounding residential properties. *Journal of Real Estate Research*, 9(4), 487-505.
- Sturtevant, L.A., & McClain, J. (2010). Examining the impact of mixed-use/mixed-income housing developments in the Richmond region. Centre for Regional Analysis: George Mason University. [https://cra.gmu.edu/pdfs/research\\_reports/recent\\_reports/Richmond\\_PHA\\_April\\_2010.pdf](https://cra.gmu.edu/pdfs/research_reports/recent_reports/Richmond_PHA_April_2010.pdf) Accessed 15 February 2023.
- Sylla, M., Lasota, T., & Szebrański, S. (2019). Valuing environmental amenities in peri-urban areas: Evidence from Poland. *Sustainability*, 11(3), Article 570.
- Taherdoost, H. (2016). Sampling methods in research methodology: How to choose a sampling technique for research. How to choose a sampling technique for research. *International Journal of Academic Research in Management*, 5(2), 18-27.
- Taliento, M., Favino, C. & Netti, A. (2019). Impact of environmental, social, and governance information on economic performance: Evidence of a corporate ‘sustainability advantage’ from Europe. *Sustainability*, 11(6), 1738.
- Teck-Hong, T. (2011). Neighbourhood preferences of house buyers: The case of Klang Valley, Malaysia. *International Journal of Housing Markets and Analysis*, 4(1), 58-59.
- Thompson, E., Butters, R. B., & Schmitz, B. T. (2012). The property value premium of a place of worship. *Contemporary Economic Policy*, 30(2), 215-222.
- Thurber, A., Bohmann, C. R., & Heflinger, C. A. (2018). Spatially integrated and socially segregated: The effects of mixed-income neighbourhoods on social well-being. *Urban Studies*, 55(9), 1859-1874.

- Tripathi, K. K., & Jha, K. N. (2018). Determining success factors for a construction organization: A structural equation modelling approach. *Journal of Management in Engineering*, 34(1), Article 04017050.
- Türkeli, S., & Schophuizen, M. (2019). Decomposing the complexity of value: Integration of digital transformation of education with circular economy transition. *Social Sciences*, 8(8), Article 243
- Vale, L. J., & Shamsuddin, S. (2017). All mixed up: Making sense of mixed-income housing developments. *Journal of the American Planning Association*, 83(1), 56-67.
- Vetter, D. M., Beltrão, K. I., & Massena, R. (2013). The impact of the sense of security from crime on residential property values in Brazilian metropolitan areas. IDB Working Paper No. IDB-WP-415. <http://dx.doi.org/10/2139/ssrn.2367688>
- Warren-Myers, G. (2012). The value of sustainability in real estate: A review from a valuation perspective. *Journal of Property Investment and Finance*, 30(2), 115-144.
- Watson, K. J., Evans, J., Karvonen, A. & Whitley, T. (2016). Capturing the social value of buildings: The promise of Social Return on Investment (SROI). *Building and Environment*, 103, 289-301.
- Woo, A. (2014). Sitting of subsidized housing in neighbourhoods: Assessing economic, neighbourhood, and social equity impacts. *Unpublished Doctoral Thesis*. Texas A & M University, United States.
- Xu, M., & Lin, B. (2020). Exploring the “not in my backyard” effect in the construction of waste incineration powerplants based on a survey in metropolises of China. *Environmental Impact Assessment Review*, 82, Article 106377.
- Zhang, L., Zhou, J., & Hui, E. C. (2020). Which types of shopping malls affect housing prices? From the perspective of spatial accessibility. *Habitat International*, 96, Article 102118.
- Zhang, L., Zhou, J., Hui, E. C., & Wen, H. (2019). The effects of a shopping mall on housing prices: A case study in Hangzhou. *International Journal of Strategic Property Management*, 23(1), 65-80.
- Zhang, M., Yen, B. T., Mulley, C., & Sipe, N. (2020). An investigation of the open-system bus rapid transit (BRT) network and property values: The case of Brisbane, Australia. *Transportation Research Part A: Policy and Practice*, 134, 16-34.
- Zou, G. (2015). The effect of the central business district on house prices in the Chengdu metropolitan area: A hedonic approach. *International Conference on Circuits and Systems*, 9–10 August, Paris, France.