

Journal of Social and Environmental Sciences (JOSES) 2(1) June 2020: 51-63.

SN 2714 2493 Online 2714 2280 Print

An Assessment of the Influence of Infill Developments on Existing Property Values in Calabar Metropolis, Nigeria

¹Ewah, M. A., ²J. B. Effiong and ³E. E. Bassey

Department of Estate Management Cross River University of Technology, Calabar, Nigeria

Corresponding author: jamesbassey4real@yahoo.com

ABSTRACT

The study assessed the influence of infill developments on existing property values in six identified neighbourhoods in Calabar, such as White House, Ekpo Abasi, Duke Town, Henshaw Town, Edibe-Edibe and Ikot Omin. The study adopted the survey research design and used both primary and secondary sources of data. The secondary data used were sourced from related studies and literature. The primary data collected with a structured questionnaire were analyzed using both descriptive and inferential statistics, which includes simple percentages and chi-square tests. The result shows that there was no significant relationship between infill developments and the existing property values in four areas of the study i.e. White House, Ekpo-Abasi, Duke-Town and Henshaw Town, while there was significant relationship between infill developments and the existing property values in Edibe-Edibe and Ikot-Omin areas. The findings further indicate that residential property, commercial property and mixed use developments were the major classes of infill developments in the six neighbourhoods studied in Calabar metropolis. The study also found that most infill developments were as a result of their market and owner occupation while in few circumstances, it is for prestige in all the six neighbourhoods. The study concluded that the influence of infill developments on the existing property values lies on the demand for accommodation which infilling development provides. The study recommends that real estate investors should principally base their decision in investing in infill development on the concept of highest and best use, in line with the viability appraisal of such investment if they are developing for profit.

KEYWORDS: Property values, Infill development, Neigbourhood, Calabar, Nigeria.

Introduction

Values of properties are determined by certain attributes, which Rosen (2009) grouped into structural, locational and neighbourhood factors or attributes. These housing values come in the form of spatial externalities, neighbourhood effects and shared characteristics. Others are amenities like accessibility, schools, shopping centres, crime control units and externality effects arising from adjacent neighbourhood properties (Can, 2001). The present housing situation in Calabar is a major focus, as infill developments increase and encourage other types of housing development. Infill development refers to new development on vacant, abandoned, passed over or underutilized property within built up areas of existing communities where infrastructures are already in place (Felt, 2007; Aly and Attwa, 2013). Infill development is an important part of the new housing construction and developers are using it to generate new opportunities for those looking for both market-rate and affordable housing within the existing neighbourhood. It would be relatively easier for government to increase housing supply through large-scale green-field land released for development. But there are issues relating to infrastructure, sustainability and urban sprawl that make such a policy undesirable. Additionally, land released for such develop ment does not equal housing supply in the short term with Greenfield sites taking years to be built. Infill developments are quick to build because the cost of infrastructural development is less than that of Greenfield development. Also, infill developments are built on already existing planned areas with adequate infrastructure.

New infill developments are expected generally to create positive externalities and recently, real estate investors have to respond to the demands of consumers for development of new infills in urban areas due to some factors like reducing time for commuting and cost (Herbert and Gibler, 2014). The use of infill developments in city centres is commonly promoted as a critical strategy to help revise the current trend of urban sprawl and urban decay. Some researchers have suggested that, infill development in any already existing urbanized area leads to both positive and negative externalities for both private and commercial land owners in the neighbourhood and the general public, creating denser urban neighbourhoods through development inside existing areas on smaller lots rather than on larger suburban tracts (Burchell and Mukheri, 2003; Lang and Danielsen, 2002). These externalities show the impact of the newly developed infill in the neighbourhood, whether affecting the price of existing property values positively or negatively. Development in existing urban area creates housing without eliminating rural open space. Most studies have carefully measured the presence of new infill development without giving much consideration to their class, compatibility and the relative size within the neighbourhood.

Developments of infills are usually associated with city centre development and are considered to be good tools for revitalization of already decayed or decaying city centre neighbourhood (EAP, 2010). Redevelopment and infill developments are usually taken together in development. Redevelopment is the conversion of an existing built property into another use. It aims for better use of the property that provides an economic return to the developer or community. An example can be the conversion of a vacant property to mixed use such residential and commercial uses. Infill refers to development of vacant land within previously built areas and these areas are served already with public infrastructure like roads, water, electricity, waste disposal etc. (University of Delaware, 2020). Infill developments usually have serious effects on the existing value of properties in the neighbourhood. Federal government policies have also encouraged new infill development. For instance, there is a current programme sponsored by several Federal Government Agencies in Delaware for sustainable community development, which has a key principle targeting federal funding to existing communities and seeks to do this by promoting transit oriented, mixed used development and land recycling (EAP, 2010). Cities grow by spreading out from the centre, with new low density developments in the outskirts of urban centres. This city growth pattern includes the rise in household incomes, higher costs of commuting and cheaper value of land in the sub-urban areas. This process of decentralization leads to some problems associated with urban sprawl (EAP, 2010). The American Planning Association describes infill development as redevelopment that optimizes prior infrastructure investment and consumes less land that is otherwise available (University of Delaware, 2020).

Recognizing that such developments are not sustainable, some communities have adopted strategies restricting the quantity of land in the sub-urban areas that can be used for development and encouraged infill development to accommodate new growth. These infill developments range from development of specialized properties such as petrol filling stations, gas plant, institutional properties and shopping malls as well as residential buildings on existing lots, to the assemblage of vacant land on which an entire new subdivision is developed, and such infill development has not been limited or restricted to city centre areas alone but occurring in a well-established residential and commercial neighbourhoods throughout Calabar. These new infill developments impose some externality effects that have both direct and indirect bearings on nearby properties, offering mixed land uses and thereby affecting the values of existing properties. It is not uncommon for existing residents to resist new infill developments within their neighbourhood for reasons such as visual pollution, increase traffic, noise, disruption of local traffic pattern or loses of neighbourhood character (Dye and McMillen, 2007). The integration of different land use patterns through infill development such as industrial, commercial and residential land use may, to some extent, result in incompatibility on the existing land use pattern of the neighbourhood.

Infill development within existing neighbourhoods can bring environmental and economic benefits, but can also disrupt life for residents and businesses, and potentially leads to the incompatibility or displacement in the neighbourhood (Funderburg and MacDonald, 2010). What is consistent is that these new infill developments take different dimensions in terms of its usage, class of development, size and facilities that are often larger than the existing structures in the surrounding area and tends to create an unusual or different developmental pattern compared to the pattern of the existing neighbourhood. This paper therefore assessed the influence of infill developments on existing property values in Calabar metropolis.

Literature Review

Infill development refers to development sited within existing urban area as opposed to Greenfield development (NHSC, 2010). According to Ryan and Weber (2007), infill development refers to scattered site developments that occur where small numbers of parcels are available for redevelopment in existing city blocks. And, that this type of development does not change the neighbourhood structure substantially because infill development is located between existing buildings oriented to current streets and lot subdivision patterns. Infill development is also the process by which vacant or under used parcels of land are developed within existing urban areas that are already largely developed (Municipal Research and Services Center, 2020). Infill development is said to be building within unused and underutilized lands within existing development patterns and not exclusively in urban areas (Office of Planning and Research, 2020). This development is essential in accommodating growth and redesigning our cities to be environmentally and socially sustainable (Office of Planning and Research, 2020). Infill development includes brownfield and greyfield development. Brownfield usually refers to large scale previously developed site and greyfield development focused on infill, particularly, if it increases the number of existing units or redevelopment of existing deteriorated buildings (Newton et al, 2011). Parker Group (2016) noted that urban infill development is the process where existing properties are re-purposed for real estate purposes. This may likely involve renovating and refurbishing vacant or underutilized properties within urban and rural areas. National League of Cities (2017) also sees urban infill as new development that is sited on vacant or underdeveloped land within an existing community that is enclosed by other types of development. Urban infill development implies that existing land is mostly built out and what is being built is in effect filling in the gaps (National League of Cities, 2017). Infill development involves tearing down of existing old buildings and replacing them with new ones or the rehabilitation of existing buildings. Brownfield infill development occurs on former industrial sites that have been abandoned, idled or underutilized. The expansion or redevelopment of these sites can be complicated by real or perceived threats of environmental contamination. Example of these sites include former warehouses, gas stations, landfills, manufacturing plants or factories. The benefit of redeveloping brownfield sites include replacing lighted landscapes with more attractive development thereby increasing economic and social well -being by creating new housing, jobs, public space and sources of tax revenue and remediating contaminated properties to protect the health and safety of the public and the environment (University of Delaware, 2020).

The Trend in Infill Development

After post World War II, many communities all over the world developed outside the city downtown centre, leaving older neighbourhoods, traditional downtowns, and central business districts became abandoned and under serviced (Zahirovic, 2012). In the past few decades, many communities have tried to revitalize their traditional downtowns through infill developments (Velma and Karen, 2017). The construction of infill development is as a result of technological changes and the requirement of users and the existing property values in the market within the downtown fall in terms of changes in demand (Davison et al, 2012). This is seen by Rowley and Phibbs (2012) to mean economic depreciation which may be influenced by age and quality of existing property development, the amount and timing of expenditure and economic conditions in the country. Old developments are less suitable for the original use intended, as a result of deterioration, change in technology and requirement of users. This requires expenditure to reduce the losses in productivity and value (Crosby et al, 2016). The study of housing to cater for the growing population of any nation is an issue of great significance. The National Housing Supply Council (2010) has noted that the supply of housing cannot meet the demand. In the past years, there has been due consideration to use vacant lands or rehabilitate the existing developments in the built up neighbourhood. Zeitz and Sirmans (2008) argued that development of infill and redevelopment can bring about new housing choices, amenities, services and jobs in a particular area or neighbourhood. As policy makers contended with these issues of housing supply, the process of formulating policies are hindered by the lack of basis for understanding the nature of housing supply and the problems of increased supply through the development of infill (Rowley and Phibbs, 2012). Implementation of housing policies are always difficult and, as such, policy makers should give room for infill developments when making housing policies that can help to increase housing supply.

The Consequences of Infill Development on Property Values

There are environmental and economic benefits to the community because of infill development. But these developments can as well affect the life of residents and their businesses, leading to resident's and business displacement (EPA, Smart and Economic Success, 2014). Urban sprawl development, which may leave some land underdeveloped can lead to more efficient and effective use of land overtime than developments occurring in an organized pattern to bring out more values to the existing properties in the neighbourhood (Peiser, 1989). Depending on the location of infill developments, they would be more valuable to existing property values, show better access to services and a limited supply of vacant lands in the area. Economists also suggest that there could be potential externalities associated with infill development on the existing property values as a result of attracting more commercial businesses and expanding home ownerships to middleclass income residents. Ryan and Weber (2014) studied

the relationship between urban design and housing values in poor neighbourhoods. Their study found that the comparison of traditional downtown development and enclaves infill development increases the value of properties, mostly. New infill development may be expected to raise the value of surrounding properties and their values are influenced not only by inherent structural features and quality but also by the surrounding area (Schafer, 2008). The value of a particular property may depend on the neighbourhood's development appearance, noise level and disorder in the quality of an area and the quality of public services provided (Ryan and Weber, 2014). Thus, infill development should in principle generate externality benefits that could be capitalized into the value of surrounding properties (Ellen et al, 2016). Felt (2007) argues that infill development is cyclical, and it generates new growth, which in turn encourages additional property values for the existing adjacent properties. A mixed-use development combining residential options with retail or light commercial uses might bring great value to the community (Walsh, 2017).

For new infill developments to have a positive impact on existing property values in the area, a favourable market must exist for these new infill developments. Farris (2009) argues that stand-alone infill development is neither a viable nor a sustainable revitalization strategy in a weak neighbourhood. To emphasize this point, Felt (2007) argues that the effect of stand-alone infill development on the existing property value diminishes as there is no demand for it. There is a negative impact on properties located close to new infill developments while those far away from the infill developments have positive impact (Thibodeau, 1990). The author estimated the effect of high-rise office buildings on residential property values. He found that the high-rise of buildings (Lennox Center) in North Dallas was an infill development located near residential properties, upon which they have had a negative impact. Using difference-in difference econometric design, Ellen et al (2006) shows a positive externality effect from the development of infill i.e., there is increase in property values around the surrounding neighbourhoods. Their study further showed that some differences exist in effect where the projects built are for non-profit or private developments. The differencedifference is a statistical technique in econometrics and quantitative research that attempts to show an experimental research design using observational study data by studying the differential effect of infill development. Wiley and Keith (2009) carried out a study to analyse pre-post changes in values of properties for sites with infill developments in suburban areas and found that there is a negative impact on property values. Wisely et al (2007) argued that many infill developers within downtown could face higher taxes, lower home values and shrinking services. Infill development potential

varies within the market. They believed that vacant lots in city centre with weak market will not attract strong infill development pattern and as a result, lead to less demand. Infill development is intended to attract residents, primarily moderate-to-high income earners and businesses to the neighbourhood in which developments are occurring. Rowley and Phibbs (2012) noted that the major problem with infill development is how to increase the quality and quantity and ensure that the supply is sufficient and affordable in meeting the needs of the low-moderate income earners that make up the workers in the central business district. In the opinion of Meliss and Lee (2011), demographic, social and economic trends direct the way of life of people and their demand for infill development. Several trends suggest a sustained increase in demand for infill development and the opportunity for developers in many markets.

Infill developments are compatible and offer mixed uses that create a sense of place (Meliss and Lee, 2011). The small footprint allowed on urban lots must be offset with greater height to accommodate the increased square footage expected in modern development. Meanwhile, aesthetic and privacy concerns arise as critics fear that infill development will overwhelm existing smaller houses, destroy neighbour character, and block sunlight and air movement (Lang and Denielsen, 2002; Szold, 2005). Hishaw (2002) opined that the construction of big development in an already developed area with small properties is an epitome of public rudeness while incompatible developments are of benefits only to the developer who carriers out infill developments rather than the owners of properties within the neighbourhood. Urban Land Institute (1999) found that many infill developers are not focusing their efforts on making their development residentialfriendly, thus giving rise to less demand for infill development within the existing neighbourhood. Leguizamon (2010) noted that factors affecting residential property values are not inherent in the commodity, good or service to which it is ascribed, but created in the minds of the individuals who make up the market. Rowley and Phibbs (2012) argued that the relationship that creates values is complex and values change when factors that influenced them do. They further identified four interdependent economic factors that create value: utility, scarcity, desire and effective purchasing power. There may be opportunities for infill with relatively high density, but the location, types and approaches to these are still not well understood. The benefits and costs to the local area of infill development can be expected to be incorporated into local housing prices (McConnell and Wiley, 2010).

Externalities of Infill Development

New infill development should in principle upgrade the neighbourhood, if it removes the negative externalities. Ding and Knaap (2010) found that subsidized infill developments have a positive effect on single-family houses sale price in the surrounding area. In illustrating the degree of concentration infill development may have on price effect, Simon et al (2010) suggested that the number of infill development units that are near give a better specification rather than dummy variables representing new infill developments regarding the number of developed units. Their study found that price effect is generally larger in areas with higher income. To extend the study of Simon et al (2010), Ding et al (2016) studied incorporated spatial lagged and interaction variables in determining the impact of the scale of new infill developments on single family house transactions. The findings from their study revealed that price effect falls rapidly in low-income areas. In contrast to the findings in their earlier study, their results concerning the scale of infill development are mixed, with the concentrations of large-scale development having a negative effect in high-income residential neighbourhoods and a concentration of mediumscale infill development having positive impacts on the high-income neighbourhood. Haurin (1998) suggested that, atypical development sells for less because they do not fit the neighbourhood. He further described "atypicality" as the degree at which a development's observed attributes deviate from typical levels in the neighbourhood. Fewer buyers strongly prefer development that are different from the majority of development in the area, and so take longer time to match buyer with such development. Thus, developers may have to discount the price of their developments to find a buyer in an average time in the market.

Rowley and Phibbs (2012) opined that carrying out prior feasibility and viability appraisal before development of infill is very important in delivering on site. They noted that from an investment view point, infill development needs to bring out profit to enhance the supply of housing. If the proceeds do not exceed the total cost and providing the developer with the level of returns that compensates the investor adequately for the risk involved in infill development, the project will not be undertaken because it is not viable. Ding et al (2016) note that the vast majority of infill development projects do not precede the feasibility appraisal stage. The actual returns required will depend upon the number of risk factors such as the quality of the infill location, the demonstration ability of the location to support the specific type of infill development, the state of demand, general economic conditions, the developer's equity requirement and the level of uncertainty surrounding the development. Rowley and Phibbs (2012) identified barriers to infill development that may occur at various stages during the development process and may be so serious that many developers will not even look at infill development as a viable development option and may reduce profit if they occur at the construction or disposal phase and as well, may even stop development in its tracks.

Infill Factors Affecting Property Values

Infill development has externality effect on the local housing price, based on demand and supply factors interacting. On the supply side, infill development increases the number and price of units of a particular housing type in the area, and consumers' demand scale determine the infill development pace (Leguizamon, 2010). Changes in population have a direct and indirect bearing on property values. Middle class residents and homeownership in an existing neighbourhood may also raise the community's socio-economic status which may increase the existing property values. As a result of growth in the population of home owners that occur as vacant lots are transformed into habitable housing, it may in turn lead to new commercial activities and economic growth, making the neighbourhood more desirable. However, owners of existing properties have to keep their views about infill development and the impact on existing property values, and may have to worry when the market responds by way of price reduction in the neighbourhood's existing properties because of new infill developments. The supply mechanism leads to a net increase in the local housing stock. Smith (2015) argues that an increase in the supply of infill development without the corresponding increase on the demand will create new competition leading to a value reduction on older developments within the neighbourhood. Thus, existing development may suffer from increase competition and unfavourable comparison with the newer and better designed infill development (Newell, 2010).

In a free market economy, the forces of demand and supply determine how infill developments affect values of existing properties in the same area. Smith (2015) argues that in the neighbourhood where the existing developments are relatively in good conditions, the externality effects on property values may be marginal or even negative. Sternacker (2003) noted that there may not be enough competition for infill development to realise the benefits of being used as an alternative to suburban development. In the opinion of Farris (2009), there is less competition in downtown in reference to residential properties, public amenities and short term cost. He also noted that residents' preferences for the suburban are more complicated than simple cost comparison between downtown versus suburban.

Differences in Price Level of Infill Development

Guerieri et al (2010) observe that initial low priced neighbourhoods are better price elastic than high priced neighbourhoods. There is appreciation in low priced neighbourhoods on the average because of the large degree of differences in high priced neighbourhoods. Schwartz et al (2006) notes that fluctuation in prices of existing properties responds to external stock such as new infill development. Newsome and Zietz (1998) also note that housing characteristics may not be valued across a given distribution of housing prices, but there is difference because of infill development. Mac et al (2010) opine that price distribution is affected by the age and value of existing properties compared to infill development in the neighbourhood. Coulson and McMillan (2007) used guartile regression to suggest that new infill development will only create a supply side stock at the top quality level of the housing market that results in a lower relative price. This in turn filters as consumers move to higher quality houses and the price movement ripples down to the lower priced houses in the neighbourhood. Obi and Lee (2011) opine that there is significant effect of new infill development on property values that are close by. Schwartz et al (2006) note that the benefits of blight removal should be felt immediately, while other effects such as those related to occupancy may take longer to unfold. Farris (2009) found that specific demographic groups are showing interest in downtown development and even larger portions of the population still decide to live in the suburban and its fringes. Felt (2007), referring to the EPA (1999) study of Northeast-Midwest in Harvard, observed that infill environmental benefits relate to the fact that vacant lots often become dumping grounds for waste, posing health and safety hazards, and abandoned buildings become avenue for crime, which can in turn decrease adjacent property values. There is a growing concern that downtown needs good developments to become the vibrant centres of cultural and social life that they once were and thus, public and political support for new infill development is on the rise. As a result, there is a general preference for new infill development by those involved in city planning and policy development.

Infill development is accepted as a vehicle for correcting the negative effects of vacant or abandoned properties because it generates growth in that area and produce notable increase in adjacent property values (Rossi el al, 2015). Saegert et al (2011) note that infill development in turn supports existing property value appreciation over time and dramatically contributes positively to the stability of the neighbourhood. Developers and city officials can attract more commercial activities and middle-class income residents to the city centre through infill developments that will give rise to high demand for accommodation within the neighbourhood (Steinacker, 2015). Lioa and Wang (2012) studied housing buyer preference and showed a strong market for downtown housing among single women and men, single mothers and unmarried couples living together. This suggests that infill residential development catered for these groups of people, and could succeed in increasing the existing property values within an area. Haughey (2001) noted that an urban infill development is a sensible smart-growth option because it is denser than suburban development and it reuses previously developed properties.

Impact of Infill Development on Existing Property Values

A study in the U.S by Blanchard, Clegg and Martin (2008) did not find any evidence suggesting that infill development will lower the value of surrounding properties after analysing 12 case studies in some neighbourhoods in Idaho. Ooi and Le (2013) note that the impact of infill development can be estimated by comparing the changes in prices of properties nearby (before and after the new development) to the change in prices of properties in the control group within the same time period. They also opine that a "supply effect" may occur if new extensive supply of houses increases the housing stock in the area and creates downward pressure on existing property values. A study by Nykänen et al (2013) shows that infill development would be 20% of the size of existing housing stock with impact on existing prices, ranging from +5% to +9%. Their study concludes that infill development is most profitable in neighbourhoods with lowest housing prices. On the other hand, in central areas with high property prices, the potential for price increase has been used already to a large extent. Among studies that prove a significant positive price impact of infill development is Ooi and Le (2013) whicch studied the changes in the wealth of existing home owners in a neighbourhood with new housing construction in Singapore. The study found infill development to have a positive and persistent impact on existing housing prices.

There are studies that suggest the impact of infill development on existing property values to be minor or insignificant. For example, Zahirovich-Herbert and Gibler (2014) examine new construction in Louisiana, U.S and its impact on existing housing prices. The study found that constructing new houses had a positive insignificant influence on existing housing prices. The authors also note that this is because new houses increase competition, leading to a fall in the existing property values when similar new size houses are built nearby. This, according to Ooi and Le (2013), is known as the "supply effect". Ahvenniemi, Pennnanen, Knuuti, Arvola and Viitanen (2018) analyse the impact of infill development on the value of existing apartments in finished urban neighbourhoods. Their study used 7 case neighbourhoods with the prices of more than 6,000 housing transactions from one decade. The findings did not support that infill development affect existing housing prices positively, neither did it show a significant negative effect. A study in California by Mathur and Ferrell (2013) cited in Ahvenniemi et al (2018) examined the impact of sub-urban transit-oriented

development (TOD) on single-family home prices in California, the U.S. and shows that the positive impact of the transit-oriented development (TOD) is statistically significant. Their study also found that prices of houses within 1/8 miles of the transit-oriented development (TOD) were 18.5% higher than those located more than 1/8 miles away. Findings from the review of literature seem to be contradictory. While some studies found infill developments to have positive impact on existing property values, some others showed that they do not have significant impacts. However, these type of studies have never been carried out in Calabar. Therefore, this sought to examine the influence of infill development on existing property values in different parts of Calabar metropolis. Findings from this study will also contribute to knowledge and literature on the dynamic impacts of infill development on existing property values.

Methodology

The study adopted the survey research design. The study area is Calabar metropolis, which is made up of Calabar Municipality and Calabar South. The population of the study comprises of resident landlords within the six neighbourhoods studied. Primary data was collected with the aid of structured guestionnaire administered on a sample size of 384 in the study area, out of which 341 copies of the instrument were retrieved for analysis. The simple random sampling technique was adopted in the selection of the sample size for the study and split within the six neighbourhoods under study. The study area comprises six (6) residential neighbourhoods within Calabar South and Calabar Municipality, namely, White House, Ekpo-Abasi, Duke Town, Henshaw Town, Edibe-Edibe and Ikot-Omin areas. Descriptive statistics using frequency tables and percentages distribution were used in analysing the data, while the hypotheses were tested using chisquare tests. The data analysed was based on the respondent landlord's perception on the influence of infill development on existing property rental values. No data was collected on rental values but the responses of the respondents based on their perceptions were presented and analysed.

Results and Discussion

Respondents are grouped in the six neighbourhoods with White House having 58 respondents, Ekpo Abasi 59 respondents, Duke Town 55 respondents, Henshaw Town 54, Edibe-Edibe 58 and Ikot Omin 57 respondents (Table 1). In terms of sex distribution, 63.9% were male while 36.1% were female. For age distribution, 31.4% were between 18-25 years, 32.6% between 26-35 years, 26.4% were 36-50 years and 38.1% singles, 54.8.7% married, 1.8% divorced, 3.2% widows and 2.1% widowers (Table 2). In terms of the educational qualification, 24.3% have O'Level, 7.3% NCE, 4.4% OND,

7.9% HND, 35.5% B.SC, 12.6% M.Sc, 5.6% Ph.D and 2.3% had none of the educational qualifications above. For occupation of the respondents, 25.2% were civil servants, 32.2% were into business, 32.0% were students and 10.5% for other occupations.

The result in Table 3 shows the types of residential properties the respondents lived in, 24.1% are in flats, 19.0% in self-contained, 25.9% in tenement buildings, 13.8% live in duplexes while 17.2% stay in other types of residential properties in White House area. For respondents in the Ekpo Abasi area, 20.3% stay in flats, 28.8% in self-containeds, 37.3% in tenement buildings, 5.1% stay in duplexes, while 8.5% stay in other types of residential properties. From the Duke Town area, 20.0% stay in flats, 9.1% in self-contained, 50.9% in tenement buildings, 3.6% stay in duplexes, while 16.4% stay in other types of residential properties. For Henshaw Town area, 35.2% stay in flats, 14.8% in selfcontained, 38.9% in tenement buildings, 5.6% stay in duplexes, while 5.6% stay in other types of residential properties. The Table also shows that, from the Edibe-

Table 1: Neighbourhoods of the Respondents

Neighbourhoods	Frequency	Percent	Valid	Cumulative
			Percent	Percent
White House Area	58	17.0	17.0	17.0
Ekpo Abasi Area	59	17.3	17.3	34.3
Duke Town Area	55	16.1	16.1	50.4
Henshaw Town Area	54	15.8	15.8	66.3
Edibe-Edibe Area	58	17.0	17.0	83.3
Ikot Omin Area	57	16.7	16.7	100.0
Total	341	100.0	100.0	

Source: Researcher's Field Work, 2018

Table 2: Descriptive Results of Characteristics
of Respondents in the six Neighbourhoods

Variables	F	%	Variables	F	%
Sex			Age		
Males	218	63.9	18-25 years	107	31.4
Females	123	36.1	26-35 years	111	32.6
Total	341	100.0	36-50 years	90	26.4
			50 years and above	33	9.6
			Total	341	100.0
Marital Status			Educational		
Single	130	38.1	Qualification		
Married	187	54.8	O' Level	83	24.3
Divorced	6	1.8	NCE	25	7.3
Widow	11	3.2	OND	15	4.4
Widower	7	2.1	HND	27	7.9
Total	341	100.0	B.Sc	121	35.5
			M.Sc	43	12.6
			Ph.D	19	5.6
			None	8	2.3
			Total	341	100.0
Occupation					
Civil Servants	86	25.2			
Business	110	32.3			
Students	109	32.0			
Others	36	10.5			
Total	341	100.0			
Source: Research	er's Fie	d Work	2018		

WHITE HOUSE AREA			EKPO ABASI AREA			
Responses	Frequency	Percent	Responses	Frequenc y	Percent	
Flat	14	24.1	Flat	12	20.3	
Self- contained	11	19.0	Self-contained	17	28.8	
Tenement building	15	25.9	Tenement building	22	37.3	
Duplex	8	13.8	Duplex	3	5.1	
Others	10	17.2	Others	5	8.5	
Total	58	100.0	Total	59	100.0	
DUKE TOWN A	REA		HENSHAW TOW	N AREA		
Responses	Frequency	Percent	Responses	Frequenc y	Percent	
Flat	11	20.0	Flat	19	35.2	
Self- contained	5	9.1	Self-contained	8	14.8	
Tenement building	28	50.9	Tenement building	21	38.9	
Duplex	2	3.6	Duplex	3	5.6	
Others	9	16.4	Others	3	5.6	
Total	55	100.0	Total	54	100.0	
EDIBE-EDIBE A	REA		IKOT OMIN ARE	A		
Responses	Frequency	Percent	Responses	Frequency	Percent	
Flat	17	29.3	Flat	23	40.4	
Self- contained	4	6.9	Self-contained	18	31.6	
Tenement building	32	55.2	Tenement building	9	15.8	
Duplex	5	8.6	Duplex	6	10.5	
Others	-	-	Others	1	1.7	
	FO	100.0	Tetel	F.7	100.0	

Table 3: Type of residential property respondents live in

Edibe area, 29.3% stay in flats, 6.9% in self-contained, 55.2% in tenement buildings and 8.6% stay in duplexes. For Ikot Omin area, 40.4% stay in flats, 31.6% in self-contained, 15.8% in tenement buildings, 10.5% stay in duplexes, while 1.7% stays in other types of residential properties.

Data in Table 4 shows that 15.5% have lived in the White House neighbourhood for 0-5 years, 25.9% for 6-10 years, 29.3% for 11-20 years, 19.0% for 21-30 years and 10.3% for 31 years and above. In the Ekpo Abasi neighbourhood, 35.6% have resided there for 0-5 years, 11.9% for 6-10 years, 22.0% for 11-20 years, 3.4% for 21-30 years and 27.1% for 31 years and above. In Duke Town neighbourhood, 20.0% have resided there for 0-5 years, 7.3% for 6-10 years, 30.9% for 11-20 years, 5.5% for 21-30 years and 36.4% for 31 years and above. In Henshaw Town neighbourhood, 5.5% have resided there for 0-5 years, 9.3% for 6-10 years, 25.9% for 11-20 years, 31.5% for 21-30 years and 27.8% for 31 years and above. In Edibe-Edibe neighbourhood, 15.5% have resided there for 0-5 years, 12.1% for 6-10 years, 27.6% for 11-20 years, 13.8% for 21-30 years and 31.0% for 31 years and above. In Ikot Omin neighbourhood, 26.3% have lived there for 0-5 years, 38.6% for 6-10 years, 12.3% for 11-20 years, 7.0% for 21-30 years and 15.8% for 31 years and above.

Table 5 indicates that 39.7% of the infill developments were residential properties, 20.7% were commercial properties, 3.4% were industrial properties,

WHITE	HOUSE AREA	4	EKPO ABASI AREA			
Responses	Frequency	Percent	Responses	Frequency	Percent	
0-5 years	9	15.5	0-5 years	21	35.6	
6-10 years	15	25.9	6-10 years	7	11.9	
11-20 years	17	29.3	11-20 years	13	22.0	
21-30 years	11	19.0	21-30 years	2	3.4	
31 years and above	6	10.3	31 years and above	16	27.1	
Total	58	100.0	Total	59	100.0	
DUKE TOWN AR	EA		HENSHAW TO	WN AREA		
Responses	Frequency	Percent	Responses	Frequency	Percent	
0-5 years	11	20.0	0-5 years	3	5.5	
6-10 years	4	7.3	6-10 years	5	9.3	
11-20 years	17	30.9	11-20 years	14	25.9	
21-30 years	3	5.5	21-30 years	17	31.5	
31 years and above	20	36.4	31 years and above	15	27.8	
Total	55	100.0	Total	54	100.0	
EDIBE-EDIBE ARE	Α		IKOT OMIN AREA			
Responses	Frequency	Percent	Responses	Frequency	Percent	
0-5 years	9	15.5	0-5 years	15	26.3	
6-10 years	7	12.1	6-10 years	22	38.6	
11-20 years	16	27.6	11-20 years	7	12.3	
21-30 years	8	13.8	21-30 years	4	7.0	
31 years and above	18	31.0	31 years and above	9	15.8	
Tetal	58	100.0	Total	57	100.0	

Table 4: Duration lived in these neighbourhoods

34.5% were mixed use developments and 1.7% other classes in the White House area. In Ekpo Abasi Area, 45.8% of the infill developments were residential properties, 8.5% were commercial properties, 10.2% were industrial properties, 30.5% were mixed use developments and 5.1% for other classes. 47.3% of the infill developments were residential properties, 23.6% were commercial properties, 1.8% were industrial properties, 12.7% were mixed use developments and 14.5% for other classes in the Duke Town area. In the Henshaw Town area, 53.7% of the infill developments were residential properties, 25.9% were commercial properties and 20.4% were mixed use developments. In the Edibe-Edibe area, 60.3% of the infill developments were residential properties, 22.4% were commercial properties, 5.2% were industrial properties, 8.6% were mixed use developments and 3.4% for other classes. Finally, 38.6% of the infill developments were residential properties, 28.1% were commercial properties, 8.8% were industrial properties, 15.8% were mixed use developments and 8.8% for other classes in the Ikot Omin area.

The result indicated in Table 6 refers to whether the increase in rental values of existing properties is as a result of infill developments in the neighbourhoods under study. It shows that 19.0% strongly agreed, 25.9% agreed, 29.3% disagree, and 25.9% strongly disagreed. With 55.2% disagreement, it implies that the increase in rental value of existing properties in White House neighbourhood is not as a result of infill developments. The result above also shows that 23.7% strongly agreed, 18.6% agreed, 30.5% disagreed and 27.1% strongly disagreed. With 57.6% disagreement, it implies that the increase in rental value of existing properties in the Ekpo Abasi neighbourhood is not as a result of infill developments. The result also shows that 21.8% strongly agreed, 27.3% agreed, 27.3% disagreed and 23.6% strongly disagreed. With 50.9% disagreement, it implies that the increase in rental value of existing properties in the Duke Town neighbourhood is not as a result of infill developments. The result also shows that 27.8% strongly agreed, 24.1% agreed, 24.1% disagreed and 33.3% strongly disagreed that the increase in rental value of existing properties in the neighbourhood Henshaw Town is as a result of infill developments. The result indicate that 28.8% strongly agreed, 22.4% agreed, 37.3% disagreed and 10.3% strongly disagreed. With 51.7% agreement, it implies that the increase in rental value of existing properties in the Edibe-Edibe neighbourhood is as a result of infill developments. Finally, the result also shows that 33.3% strongly agreed, 28.1% agreed, 31.6% disagreed and 7.0% strongly disagreed. With 61.4% agreement, it implies that the increase in rental value of existing properties in Ikot Omin neighbourhood is as a result of infill developments.

From Table 7, 32.8% of the respondents went for market demand, 20.7% prestige, 31.0% for owner occupation as factors giving rise to infill developments in the White House neighbourhood while 15.5% went for others indicating that there are factors different from the above three factors. Market demand seems to be the most reason for infill developments and for owner occupation in this area. From Table 7, 47.5% of the

WHITE HOUSE AREA			EKPO ABASI AREA			
Responses	Frequency	Percent	Responses	Frequency	Percent	
Residential	23	39.7	Residential	27	45.8	
Commercial	12	20.7	Commercial	5	8.5	
Industrial	2	3.4	Industrial	6	10.2	
Mixed use development	20	34.5	Mixed use development	18	30.5	
Others	1	1.7	Others	3	5.1	
Total	58	100.0	Total	59	100.0	
DUKE TOWN AREA			HENSHAW TOWN AREA			
Responses	Frequency	Percent	Responses	Frequency	Percent	
Residential	26	47.3	Residential	29	53.7	
Commercial	13	23.6	Commercial	14	25.9	
Industrial	1	1.8	Industrial	-	-	
Mixed use development	7	12.7	Mixed use development	11	20.4	
Others	8	14.5	Others	-	-	
Total	55	100.0	Total	54	100.0	
EDIBE-EDIBE A	REA		IKOT OMIN AREA			
Responses	Frequency	Percent	Responses	Frequency	Percent	
Residential	35	60.3	Residential	22	38.6	
Commercial	13	22.4	Commercial	16	28.1	
Industrial	3	5.2	Industrial	5	8.8	
Mixed use development	5	8.6	Mixed use development	9	15.8	
Others	2	3.4	Others	5	8.8	
Total	58	100.0	Total	57	100.0	

Table 5: Classes of infill developments in the neighbourhoods

Source: Researcher's Field Work, 2018

respondents went for market demand, 10.2% prestige, 30.5% for owner occupation as factors giving rise to infill developments in Ekpo Abasi neighbourhood while 11.9% went for others, indicating that there are factors different from the above three factors. Market demand seems to be the most reason for infill developments and for owner occupation also in this area. From the data, 14.5% of the respondents went for market demand, 34.5% prestige, 38.2% for owner occupation as factors giving rise to infill developments in Duke Town neighbourhood while 12.7% went for others indicating that there are factors different from the above three factors. Owner's occupation seems to be the most reason for infill developments and prestige in Duke Town

Table 6: Increase in rental value of existing properties as a result of infill developments in the neighbourhoods

WHITE H	IOUSE AREA		EKPO ABASI AREA			
Responses	Frequency	Percent	Responses	Frequency	Perce	
					nt	
Strongly Agree	11	19.0	Strongly Agree	16	27.1	
Agree	15	25.9	Agree	18	30.5	
Disagree	17	29.3	Disagree	11	18.6	
Strongly Disagree	15	25.9	Strongly Disagree	14	23.7	
Total	58	100.0	Total	59	100.0	
DUKE TOWN AREA	•		HENSHAW TOWN	AREA		
Responses	Frequency	Percent	Responses	Frequency	Perce	
					nt	
Strongly Agree	13	23.6	Strongly Agree	18	33.3	
Agree	15	27.3	Agree	8	14.8	
Disagree	15	27.3	Disagree	13	24.1	
Strongly Disagree	12	21.8	Strongly Disagree	15	27.8	
Total	55	100.0	Total	54	100.0	
EDIBE-EDIBE AREA			IKOT OMIN AREA			
Responses	Frequency	Percent	Responses	Frequency	Perce	
					nt	
Strongly Agree	6	10.2	Strongly Agree	4	7.0	
Agree	22	37.3	Agree	18	31.6	
Disagree	13	22.0	Disagree	16	28.1	
Strongly Disagree	17	28.8	Strongly Disagree	19	33.3	
Total	58	100.0	Total	57	100.0	

Source: Researcher's Field Work, 2018

WHITE	HOUSE AREA		EKPO ABASI AREA			
Responses	Frequency	Percent	Responses	Frequency	Percent	
Market demand	19	32.8	Market demand	28	47.5	
Prestige	12	20.7	Prestige	6	10.2	
Owner's occupation	18	31.0	Owner's occupation	18	30.5	
Others	9	15.5	Others	7	11.9	
Total	58	100.0	Total	59	100.0	
DUKE TOWN ARE	4		HENSHAW TOWN	AREA		
Responses	Frequency	Percent	Responses	Frequency	Percent	
Market demand	8	14.5	Market demand	1	1.9	
Prestige	19	34.5	Prestige	26	48.1	
Owner's	21	20.2	Owner's	12	24.1	
occupation	21	38.2	occupation	15	24.1	
Others	7	12.7	Others	14	25.9	
Total	55	100.0	Total	54	100.0	
EDIBE-EDIBE AREA	1		IKOT OMIN AREA			
Responses	Frequency	Percent	Responses	Frequency	Percent	
Market demand	16	27.6	Market demand	21	36.8	
Prestige	8	13.8	Prestige	3	5.3	
Owner's	10	22.0	Owner's	20	40.1	
occupation	19	52.8	occupation	28	49.1	
Others	15	25.9	Others	5	8.8	
Total	58	100.0	Total	57	100.0	

Table 7: Factors giving rise to infill developments in these neighbourhoods

Source: Researcher's Field Work, 2018

area. From Table 7 also, 1.9% of the respondents went for market demand, 48.1% prestige, 24.1% for owner occupation and 25.9% as factors giving rise to infill developments in Henshaw Town neighbourhood. Prestige, Owner's occupation and other factors seems to be the most reason for infill developments in Henshaw Town area. From Table 7, 27.6% of the respondents went for market demand, 13.8% prestige, 32.8% for owner occupation and 25.9% for others as factors giving rise to infill developments in the Edibe-Edibe neighbourhood. Owner's occupation, market demand and other factors seem to be the most reason for infill developments in Edibe-Edibe area. Finally, the result in Table 7 above indicates that 36.8% of the respondents went for market demand, 5.3% prestige, 49.1% for owner occupation and 8.8% for others as factors giving rise to infill developments in the Ikot Omin neighbourhood. Owner's occupation and market demand seems to be the most reason for infill developments in Ikot Omin area.

Test of Hypotheses

- **Ho:** There is no significant relationship between infill developments and existing property values in the neighbourhood.
- **Hi:** There is a significant relationship between infill developments and existing property values in the neighbourhood.

The above hypotheses were tested using the chisquare X^2 test in the six neighbourhoods (Table 8). The following question was tested.

There is an increase in rental value of existing properties as a result of these infill developments in this neighbourhood?

Degree of freedom = 3 P < 0.05

 $X^2 = 1.620$

 X^2 tabulated from Critical value table = 7.815

Decision Rule: Reject Ho in favour of Hi if X2 calculated is greater than tabulated.

From the chi-square computation in Table 8, x^2 calculated is less than x^2 tabulated from the contingent table i.e. $X^2 = 1.620 < X^2 = 7.815$ testing level of significance at 0.05 and degree of freedom of 3. The alternative hypothesis is rejected showing that there is no significant relationship between infill development and existing property values in White House neighbourhood. The implication of this result is that new infill developments do not influence the rental values of properties in White House area.

From the Chi-square in Table 9, degree of freedom = 3 P < 0.05 $X^2 = 3.927$

Table 8: Chi Square Test for White House Area

Responses	Fo	Fe	Fo – Fe	Fo – Fe ²	Fo – Fe ² /Fe		
SA	11	14.5	-3.5	12.15	0.845		
A	15	14.5	0.5	0.25	0.172		
D	17	14.5	2.5	6.25	0.431		
SD	15	14.5	0.5	0.25	0.172		
Total	58	58	-	-	X ² = 1.620		

Table 9: Chi Square Test for Henshaw Town Area

Responses	Fo	Fe	Fo – Fe	Fo – Fe ²	Fo – Fe ² /Fe
SA	15	13.5	1.5	2.25	0.167
А	13	13.5	-0.5	0.25	0.019
D	8	13.5	-5.5	30.25	2.241
SD	18	13.5	4.5	20.25	1.50
Total	54	54	-	-	X ² = 3.927

 X^2 tabulated from Critical value table = 7.815 **Decision Rule**: Reject Ho in favour of Hi if X^2 calculated is greater than tabulated.

From the chi-square computation in Table 9, x^2 calculated is less than x^2 tabulated from the contingent table i.e. $X^2 = 3.927 < X^2 = 7.815$ testing level of significance at 0.05 and degree of freedom of 3. The alternative hypothesis is rejected showing that there is no significant relationship between infill developments and existing property values in Henshaw Town neighbourhood. The implication of this result is that new infill developments do not influence the rental values of properties in Henshaw Town area.

From the Chi-square in Table 10, the degree of freedom = 3

P < 0.05

 $X^2 = 9.448$

 X^2 tabulated from Critical value table = 7.815

Decision Rule: Reject Ho in favour of Hi if X^2 calculated is greater than tabulated.

From the chi-square computation in Table 10, x^2 calculated is greater than x^2 tabulated from the contingent table i.e. $X^2 = 9.448 > X^2 = 7.815$ testing level of significance at 0.05 and degree of freedom of 3. The null hypothesis is rejected showing that there is a significant relationship between infill developments and existing property values in Edibe-Edibe neighbourhood. The implication of this result is that new infill developments have influenced the rental values of properties in Edibe-Edibe area.

From the Chi-square in Table 11, degree of freedom = 3

```
P < 0.05
```

 $X^2 = 10.158$

 X^2 tabulated from Critical value table = 7.815 Decision Rule: Reject Ho in favour of Hi if X^2 calculated is greater than tabulated.

Responses	Fo	Fe	Fo – Fe	Fo – Fe ²	Fo – Fe ² /Fe
SA	17	14.5	2.5	6.25	0.431
Α	13	14.5	-1.5	2.25	0.155
D	22	14.5	7.5	56.25	3.879
SD	6	14.5	-8.5	72.25	4.983
Total	58	58	-	_	$X^2 = 9.448$

Table 11: Chi Square Test for Ikot-Omin Area

Table 10: Chi Square Test for Edibe-Edibe Area

Responses	Fo	Fe	Fo – Fe	Fo – Fe ²	Fo – Fe ² /Fe
SA	19	14.25	4.75	22.5625	1.583
А	16	14.25	1.75	3.0625	0.215
D	18	14.25	3.75	14.0625	0.987
SD	4	14.25	-10.25	105.0625	7.373
Total	58	58	-	-	X ² = 10.158

From the chi-square computation in Table 11, x^2 calculated is greater than x2 tabulated from the contingent table i.e. $X^2 = 10.158 > X^2 = 7.815$ testing level of significance at 0.05 and degree of freedom of 3. The null hypothesis is rejected showing that there is a significant relationship between infill developments and existing property values in Ikot-Omin neighbourhood. The implication of this result is that new infill developments have influenced the rental values of properties in Ikot-Omin area.

Conclusion

The hypotheses were tested using the chi-square statistics and the calculated value in Edibe-Edibe and Ikot-Omin neighbourhoods were greater than the tabulated and significant at 0.05. Also, the calculated chi-square test for the other four areas of White House, Ekpo-Abasi, Duke Town and Henshaw Town were less than that tabulated and were not significant at 0.05. The findings from the test of hypotheses show that the results were not significant in White House, Ekpo-Abasi, Duke Town and Henshaw Town neighbourhoods and, as such, there is no significant relationship between infill developments and existing property values in these four neighbourhoods. This implies that the increase in rental value of existing properties in these neighbourhoods is not as a result of infill developments in the area. The result also shows significance in two neighbourhoods of Edibe-Edibe and Ikot-Omin areas, indicating that there is a significant relationship between infill developments and existing property values in these neighbourhoods. The implication of this result is that infill developments in Edibe-Edibe and Ikot-Omin neighbourhoods have influenced the existing rental values of residential properties within these two neighbourhoods. The study further indicates that residential property, commercial property and mixed use developments were the major classes of infill developments in the six neighbourhoods studied in Calabar metropolis. The study also found that most infill developments were as a result of their market and owner occupation while in few circumstances, it is for prestige in all the six neighbourhoods. The research concluded that, the influence of infill developments on the existing property values lies on the demand of its products. Infill developments in a weak real estate market depresses the existing property values the more. However, when located in hot real estate markets, the existing property values are increased. The study therefore recommends that, real estate investors should principally base their decision in investing in infill developments on the concept of highest and best use in line with the viability appraisal of such investment if it's for economic motive.

References

- Ahvenniemi, A., Pennnanen, K., Knuuti, A., Arvola, A., and Viitanen, K. (2018). "Impact of infill development on prices of existing apartments in finished urban neighbourhoods". International Journal of Strategic and Property Management, 22(3): 157-167.
- Ally, S. S. and Attwa, Y. A. (2013). "Infill development as an approach for promoting compactness of urban form". WIT Transaction on Ecology and the Environment, Sustainable Development and Planning 173(6): 455-466.
- Blanchard, C., Clegg, E., and Martin, L. (2008). "The consequences of residential infill development on existing neighborhoods in the Treasure Valley. Project Report". Urban Land Institute, Idaho/Smart Growth, Idaho, Boise, Idaho, USA. Retrieved on 5th May, 2020 from http:// www.idahosmartgrowth.org/app/ uploads/2014/05/uliisg_infill_report.pdf
- Can, A. (2001). "Measurement of neighborhood dynamics in urban house prices". Journal of Economics-Geography, 66: 254-272.
- Coulson, J. M., and McMillen, D. P. (2007). "The dynamics of intraurban quantile housing prices indices". *Journal of Urban Studies*, 44: 1517-1537.
- Ding, C., and Knaap, G. (2010). "Property values in inner city neighborhood: The effect of infill development and economic development". *Journal of Housing Policy Debate*, 13(4): 701-726.
- Ding, C., Simons, R. and Baku, E. (2016). "The effect of residential investment on nearby property values: Evidence from Cleveland". *Journal of Real Estate Research*, 19(1/2): 23-47.

- Division, G., Gurran, N., Dan, R., Pinnegar, S., Randolph, B., and Bramley, G. (2012). "Affordable housing, urban renewal and planning: emerging practice in Queensland, South Australia and New South Wales". AHURI Final Report No.105. Melbourne: Australian Housing and Urban Research Institute. Retrieved on 12th July, 2018 from http:// www.ahuriedu.au
- Dye, R. F., and McMillen, D. P. (2007). "Teardown and land value". *Journal of Urban Economics*, 61: 45-63.
- Ellen, I. G., Schill, M. H., Susan, S., and Schwartz, A. E. (2016). "Building homes, reviving neighborhood: Spillovers from residential construction of owneroccupied housing in new York city". *Journal of Housing Research*, 12(2): 185-216.
- EPA. (2010). Attracting infill development in distressed communities. Retrieved on 21st June, 2018 from http://www.epa.gov/smarthgrowth.pdf.
- Farris, J. T. (2009). "The barriers of using urban infill development to achieve smart growth". *Journal of Housing Policy Debate*, 12(1): 18-30.
- Felt, E. (2007). Patching the fabric of the neighoorhood: The practical challenges of infill housing development. Harvard Joint Centre for Housing Studies and Neighboorhood works.
- Guerrieri, V., Hartley, D. and Hurst, E. (2010). "Endogenous gentrification and housing price dynamic". *NBER working paper 16237*. NBER, Cambridge.
- Haughey, R. (2001). *Urban infill Housing*. Washington, D.C: ULI-The Urban Land Institute.
- Haurin, D. (1998). "Developing infill housing in inner city neighbourhood". *Journal of Urban Land Institute Press*, 24(5): 24-32.
- Herbert, V. Z., and Gibler, K. M. (2014). "The impact of new development on housing prices". *Journal of Housing Economics*, 26(6): 1-18.
- Hinshaw, M. L. (2002). Monster house. Journal of Town planning. 68(5), 25-27.
- Leguizamon, S. (2010). "The influence of reference group house size on house price". *Journal of Real Estate Economic*, 38(3): 507-527.
- Liao, W., and Wang, X. (2012). "Hedonic house price and spatial quantile regression". *Journal of Housing Economic*, 21(3): 16-27.
- Mac, S., Choy, L., and Ito, W. (2010). "Housing price externalities in US metropolitan area". *Journal of Housing Research*, 7(2): 209-241.
- McConnell, V. A., and Matthias, C. (2009). "Urban Growth Externalities and Neighborhood Incentives: Another Cause of Urban Sprawl?" UMBC Economics Department Working Papers 09-106, UMBC Department of Economics.
- McConnel, V. A., and Wiley, K. (2010). "Infill development: Perspectives and evidence from Economics and Planning". *Journal of Resources for the Future*,

13(5): 202-238.

- Meliss, J., and Lee, A. (2011). "Understanding downtown housing market". *Journal of Real Estate Research*, 23(2): 5-11.
- Municipal Research and Services Center. (2020). *Infill development*. Retrieved on 25th March, 2020 from http://mrsc.org/Home/Explore-Topics/ Planning/Development-Types-and-Land-Uses/Infill-Development-Completing-the-Community-Fabric.aspx
- National Housing Supply Council. (2010). Retrieved on 22nd June, 2018 from http://www.gov/nhsc/upload/file/2671.pd.
- Newell, T. O. (2010). "Development and neighborhood revitalization: The effects of new infill investment on property values in Durham". *The Michigan Journal of Business*, 3(2): 97-120.
- National League of Cities. (2017). Urban infill and Brownfields redevelopment. 25th March, 2020 from https://www.nlc.org/resource/urban-infillbrownfields-redevelopment
- Newsome, B. and Zietz, J. (1998). "Adjusting comparable sales using multiple regression analysis: The need for segmentation". *Appraisal Journal*, 60(6): 129-135.
- Newton, P. O., Murray, S. E., and Rawlinson, R. C. (2011). "Towards a new development model for housing regeneration in Grayfield residential precincts". AHURI, Final Report No 171. Accessed on 22nd June, 2018 from http:// www.siliconvalleyathome.org/wp-contect/ upload/2016/05/How-do-we-Tackle-the-Affordable-Housing-Crisis-A-%09Policy-Roadmap.pd
- Nykänen, V., Lahti, P., Knuuti, A., Hasu, E., Staffans, A., Kurvinen, A., Niemi, O., and Virta, J. (2013). "Urban infill and residential redevelopment". VTT Technology 97. 162 p. + app. 3p. Espoo. Retrieved on 5th May, 2020 from http://www.vtt.fi/inf/pdf/ technology/2013/T97.pdf
- Obi, J. T., and Lee, T. T. (2011). "The contagion effect of infill development on local housing prices". Institute of real estate studies, IRES2011-034. Working paper series. Retrieved on 22nd June, 2018 from http://www.IRES2011-034.pdf
- Office of Research and Planning. (2020). *Infill development*. Retrieved on 25th March, 2020 from http:// opr.ca.gov/planning/land-use/infill-development/
- Ooi, J. T. L., and Le, T. T. T. (2013). "The spillover effects of infill developments on local housing prices". *Regional Science and Urban Economics*, 43(6): 850-861. Retrieved on 5th May, 2020 from https://doi.org/10.1016/ j.regsciurbeco.2013.08.002
- Parker Group. (2016). *Benefits of urban infill development*. Retrieved on 25th March, 2020 from https://parkergroupservices.com/urban-infill-

development/

- Peiser, R. B. (1989). "The effects of mixed-income multi -family rental housing development on single family housing values". *Journal of Urban Land Institute for Development*, Centre for Real Estate, 21(2): 42-79.
- Rosen, S. (2009). "Hedonic prices and implicit market: Product differentiation in pure competition". *Journal of Political Economy*, 82(1): 34-55.
- Rowley, S., and Phibbs, P. (2012). "Delivering diverse and affordable housing on infill development sites". *AHURI. Final Rrport No.193*. Melbourne: Australian Housing and Urban Research Institute. Retrieved on 7th June, 2018 from http:// www.ahuriedu.au"
- Ryan, B. D., and Weber, R. U. (2014). "Valuing new development in distressed urban neighbourhood". *Journal of America Planning Association*, 73(1): 100 -111
- Saegert, S., Libman, A., and Fields, W. (2012). "Interrupting place-based inequality: Building sustainable Communities through shared equity homeownership". *Journal of Housing Debate*, 34 (4): 23-35.
- Schafer, R. (2008). "The effect of BMIR Housing on property values". *Journal of Land Economics*, 48(3): 282-286.
- Schwartz, C., Hampton, T., LaSchwartz, C., Hampton, T., Lawis, C., and Norman, D. (2006). "A Survey of housing equity withdrawal and injection". *Research Discussion paper 2006-08*, reserve Bank of Austicalia, Sydney. Accessed from http:// www.idahosmartgrowth.org.pdf.
- Simon, R. A., Quertcia, R. G. and Maric, I. V. (2010). "The value impact of new resident construction and neighborhood disinvestment of residential sales prices". *Journal of Real Estate Research*, 45 (11): 147-162.
- Sirmans, C. F., and Zietz, E. N. (2008). "The composition of hedonic pricing models". *Journal of Real Estate Literature*, 13(1): 3-46.
- Smith, B. C. (2009). "If you promise to build it, will they come? The interaction between local economic development policy and the real estate market: Evidence from tax increment finance districts". Journal of Real Estate Economics, 39(2): 209-234.
- Smith, L. (2015). Planning for housing commons Library standard. SN/Bc/3741, Science and Environmental Section. Retrieved on 1st July, 2018 from http://www.parliment.UK/business/publicatons/ research/briefingpapersNO3741/plann ingforh ousing.pdf
- Sternacker, A. (2003). "Infill development and affordable housing: Patterns from 1996 to 2000". *Journal of Urban Affairs*, 38(4): 492-509.

Szold, T. S. (2005). "Mansionization and discontents:

Planning and challenge of regulating monster homes". *Journal of America's Planning Association*, 71(2): 189-2313.

- Thibodeau, T. G. (1990). "Estimating the effect of hightrise office buildings on residential property values". *Journal of Land Economics*, 66(4): 402-408.
- University of Delaware. (2020). What is infill and redevelopment? Planning for complete communities in Delaware, Planning tools, Efficient land use. Retrieved on 5th May, 2020 from https:// www.completecommunitiesde.org/planning/ landuse/what-is-infill/
- Urban Land Institute (1999). *Smart growth: Myth and F act.* Washington, D. C: Urban Land Institute Press.
- Velma, Z. H., and Karen. M. G. (2017). "The effect of new residential construction on housing prices". *Journal of Housing Economics*, 26(1): 1-18. Retrieved on 25th June, 2018 from http:// www.elsevier.com/locate/jhec.pdf
- Walsh, D. (2017). Infill development and construction: A great new opportunity in today's market. Accessed on 5th July, 2018 from https:// sellnewhomes.com/CNHS-%09Blog/ArticleID/19
- Wiley, F., and Keith, A. (2009). An Exploration of the Impact of Infill on Neighbourhoods property Values. Unpublished Doctorate Dissertation. Available from Dissertation and Theses database (UMINo10221).
- Wisely, J., Kathleen, G., Steve, N., and Christina, H. (2007). "Home owners lots in three ways; Taxes can rise, Values fall, and Services shrink". *Journal of Real Estate Economic*, 24: 6-12.
- Zahirovic, H.V. (2012). "Historic preservationand residential property values: evidence from quantile regression". *Journal of Urban Studies*, 49(4): 369-382.
- Zahirovich-Herbert, V., and Gibler, K. (2014). "The effect of new residential construction on housing prices". *Journal of Housing Economics*, 26, 1-18. Retrieved on 5th May, 2020 from https://doi.org/10.1016/j.jhe.2014.06.003
- Zietz, J. Z. and Sirmans, G. S. (2008). "Determinants of house price: A quantile regression approach". *Journal of Real Estate Finance Economics*, 37: 317-333.