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Externalities and Planning Failure in the Housing Market of an African City

Abstract

Purpose

Planning is logically applied to address negative externalities but an alternative is financial compensation to the victim of negative spill-over effects. This paper examines the rent discount required to compensate tenants in an African city for a negative externality of the location of a grave within the bounds of their home. It also assesses the suitability of this as a remedy.

Method/Design: This study adopts a discrete choice experiment to analyse tenants' acceptability to levels of rent discounts when a grave is imposed on their home.

Findings: The study estimates that tenants in the Nigerian city of Akure require a reduction of between a 15% and 20% reduction in the rental value of a residential property to compensate for the imposition of grave. However, many households would prefer to move rather than negotiate a discount. Others, especially those on low incomes will likely suffer the loss of welfare without a rent discount. The study concludes that a compensatory approach is not an acceptable solution to welfare issues caused by the planning failure.

Practical implication: As reductions in rent to compensate for the effect of a grave in a private home are unlikely in a market with excess demand it is a clear argument for effective planning and environmental law.

Originality: It is the first study of the impact of negative externalities on the housing market of an African city.

Limitation: The investigation is based on a hypothetical choices experiment. However, the results obtained are subject to a series of validation processes.

Keywords: negative externality, planning failure, housing market, compensation, graves, Africa.

Paper Type: Research paper

Introduction

Negative externalities in cities have been addressed through planning and development control from the beginning of the last century in developed countries. In Africa and developing countries the role of local planning is less effective. Despite the presence of established environmental health law and planning policy that ostensibly regulate urban land use in Africa there are many issues about the lack of implementation (Akinbogun *et al.*, 2014). Furthermore, tenants in developing countries tend to have restricted property rights offering little or no protections to their wider rights to social welfare, and in particular to nearby development with negative externalities (see Dowall & Ellis, 2009). The problems of negative externalities in urban areas are therefore likely to be more extensive in these countries. This paper focuses on the impact raised by such negative externalities in the context of a lack of planning and weak property rights, using the location of graves on residential properties in a Nigeria city as a case study.

The paper assesses the acceptability of potential discounts to rents as a mechanism for compensation for the imposed impact of a grave on a tenanted home. In a sense it is a test of the classic case of internalising the externality. It addresses the question on the acceptability of a discount as a trade-off for a loss in welfare and utility in a house with a grave. The first step of the research is to apply a stated preference approach whereby households are asked to express their preferences in a face to face questionnaire through a series of scenarios. These choices are then analysed using a choice based conjoint analysis to assess tenants' sensitivity to potential discounts.

It begins with explaining the local context and then explains the theoretical background and previous literature. The next section describes the research methods including an explanation of the stated preference approach, the preparation and use of discrete choice scenarios within the tenants' survey, the data collection and its analysis. The paper then presents the results of the analysis and discusses the implications for the acceptability of a discount as a solution to the use of a private home for a grave. The paper finishes by considering the wider implications for African cities.

The Local Context

Residential properties with graves are common in Nigeria cities and the study is based on the experience of Akure, the capital city of Ondo State in the south west of the country. It is a fast growing city with a population of 556,300 in 2015 (NPC, 2016). By virtue of the political status of the city, it represents the commercial nerve centre and most populous city in Ondo State. As a fast growing centre Akure is typical of many African cities. Despite the size of the city there is only one public graveyard. This public cemetery is reserved for the interment of unidentified corpses, lunatics and people that died of AIDS and other strange illnesses. However, many religious organizations own a graveyard and residents have access to it by virtue of their membership. To a large extent the demand for graves as the means of disposing human remains is proscribed by religions. None of the major local religions namely Christianity and Islam and traditional religion supports cremation and other methods of disposing human remains.

With the shortage of cemeteries, as in many Nigerian cities, the location of a grave on residential properties has become an accepted culture among landlords. Debatably, this is a subject of private nuisance to tenants who may not be compensated, and perhaps a public nuisance to the owners of adjoining properties and other stakeholders. The Burial on Private Premises law of Ondo State stipulates that:

"No corpse shall be buried in or on any private premises unless the disease was by customary law entitled to be buried thereon and the person responsible for burying the corpse has obtained a written authorization from a Health Officer for the burial of the corpse"

However, the law lacks sufficient definition to be fully binding and it provides for exceptions to the rule. It allows those permitted by customary law to bury a deceased on residential premises. In addition, the law also allows permission to be sought to locate a grave within a residential property based on approval of an environmental health officer. The implication is that compliance with this law is rendered voluntary.

The Ondo State Environmental Health Agency is charged with the responsibility of preventing the location of graves on residential property in Akure. However, against the backdrop of an ambivalent legal context the manpower that is responsible for enforcing the law is also inadequate with only 12 environmental officers employed to oversee the residential environment of about half a million people. The cumulative effect is that a tenant whose

landlord decides to locate a grave on a residential property may think that permission has been sought or he is entitled to do so by virtue of customary law. Consequently, this reduces tenants' inclination and ability to object.

The issue is amplified by the high proportion of households who are private tenants. A substantial percentage of the low and middle income groups reside in houses provided by the private rented residential sector (PRS) in Nigeria, and in Akure in particular. Statistics on the precise contribution of the sector is difficult to find. According to Akpom (1996), most of the housing stock in this sector in Nigeria are provided by individuals who occupy a flat in a building/compound (or rooms in the case of rooming apartment), and let out the remaining parts. In addition a high proportion of the rental housing stock is in the informal (rather than the formal) market based on traditional customary law, and outside the direct control of government rules and regulations (Chirayath et al, 2005). There is also weak information restricting the efficiency of the market (Akinbogun *et al.*, 2014). Few of these tenancies have a legally acceptable rental agreement and security of tenure, which contributes to the anxiety of tenants in the PRS and the ability of landlords to locate graves in their residential accommodation.

Theoretical Background

A house can be seen as a complex or composite good defined by its attributes (Lancaster, 1966; Rosen, 1974). In particular individual house prices and rents can be seen as a function of physical attributes and location. These theoretical underpinnings provide the essential base for a myriad of hedonic house price studies since the mid-1970s in which revealed preferences give rise to estimated implicit prices for particular attributes (Jones & Watkins, 2009). As a result of market forces housing with undesirable features achieve lower prices reflecting households' negative views. The popular notion in the literature is that of a negative externality with an impact on neighbouring properties. Unregulated land markets suffer from endemic problems from systematic externalities associated with land use, especially in the more densely developed context of cities (Cheshire, 2013). Recent empirical examples assessing the effects of 'nuisances' include studies of wind farms (Sims *et al.*, 2007), mobile cell phone masts (Bond, 2007), and airport noise (Cohen & Coughlin, 2008).

In the context of this paper the contention is the location of graves nearby is undesirable but the existing research on their impact is very limited. A study by Larsen & Coleman (2010) on the impact of a graveyard on homes near four cemeteries in Ohio estimates that the view detracts up to 10% from the mean house price. However, parameter estimates from a similar hedonic price study by Bolitzer & Netusil (2000) in Portland, Oregon, finds that a cemetery has no statistical significant effects on residential property sale values. Both these studies have flaws. The Portland study defines proximity arbitrarily as a distance of 1500 feet and does not distinguish between properties with or without cemetery views. The Ohio study is based on small local samples that cover transactions over 40 to 50 year time periods. Both studies suffer from only including distances to open space/cemeteries so do not control for other accessibility factors affecting house prices. These studies therefore produce both inconclusive and debatable results on the impact of a graveyard on the price of nearby homes.

Hedonic studies assume that in choosing a home households optimise their utility subject to a budget constraint as first set out originally by Muth (1968). In general in these standard neoclassical models households trade off desired and undesired characteristics from a choice set when selecting a home. Despite the wide acceptability of this utility maximisation framework as the foundation of neo-classical theory in microeconomics, it has been criticised in some domains. For instance, Simon (1997) argues that individuals do not often choose the best alternative in a choice set; rather they choose alternatives considered satisfactory within the limits of their bounded rationality. According to Sen (cited in Aleskerov *et al.*, 2007) the theory also suffers from the fact that rational behaviour is not often based on utility maximisation. Other classic empirical studies have also shown that the utility maximisation paradigm may not always be the basis for choice-making under some cognitive bounds and a budget constraint (see Kahneman & Tversky, 2000; Kahneman & Thaler 2006). Further Jones (1979) has also argued that constraint can dominate choice in practice in the housing system.

A translation of these perspectives to African cities with severe housing crises sees low/medium income households having limited purchasing power and any housing even with undesirable characteristics may be all that is available (World Bank, 2015). These market constraints may be seen as taking the first home that is acceptable in a 'Simon' world. And in such a realm of housing shortage most households are not in a position/power to make the trade-offs noted above. In other words the undesirable impact of graves on household utility is not priced into market rents. A grave then is a true market externality. However, the role of

graves in Nigeria is more complex involving property rights. A property owner and a tenant often live as immediate neighbours by living in different apartments within a compound. The property owners have a superior right of use and may decide to put a grave within the compound without considering the impact on his neighbour. Many tenants are unlikely to be in position to negotiate a discount given the housing shortage and the only option is to try to move, if they can.

Research Method

The normal approach to assess the impact of a negative characteristic on the rents or prices of housing is to apply a hedonic regression model as noted above. However, these studies require transactions data on market values that are not available in the informal housing sector of Akure (or indeed many third world cities). These models also assume that house prices reflect choices that again does not apply in our case study area. Instead, the core approach applied is the use of a stated preference (SP) framework. This method has become an established technique in which people are asked to choose between different hypothetical market scenarios (Green & Srinivasan, 1990). This approach is also important here as it focuses on choices only without reference to constraints, so that it can identify the costs of a grave in a home to households even if not reflected in market prices. We return to this issue when discussing the implications of the results.

The SP technique has been widely applied in economics including a range of housing studies. For instance, Walker *et al.* (2002) investigate the potential housing choices of tenants between public housing estates with differential neighbourhood quality in Oxford. Tenants were asked to choose their preferred housing choice from a set of scenarios comprising notional choices, such as rent discount on properties in an impacted neighbourhood. The findings show that most tenants are not willing to take advantage of a discount in rent to move to housing estate considered worse when compared to their current housing estate. Another study by Thanos *et al.* (2011) on the impact of aircraft's noise on the residents near a proposed airport in Athens reveals that homeowners will pay €13.12 monthly to end aircraft noise in their vicinity.

The SP method applied in this research is known as a discrete choice experiment. It is an attribute based approach, which presents respondents with a set of hypothetical alternatives and asking them to make their choice (Holmes & Adamowicz, 2003; Bateman *et al.*, 2002). The

preference for this method over other conventional SP approaches such as contingent valuation, rating and ranking is due to its consistency with the theory of consumer economics. This approach was originally developed by Louviere & Hensher (1982) and Louviere and Woodworth (1983). It exhibits a similar theoretical framework with dichotomous-choice contingent valuation within a Random Utility Model (see Luce, 1959; McFadden, 1986), and a common basis for empirical analysis in limited dependent variable econometrics (Greene, 1997). The particular form of SP used here is Choice Based Conjoint (CBC) and the stages involved in this choice experiment are now explained.

Stage 1: Identification of Attributes and Definition of Levels

To gather reliable data from respondents in a CBC survey, it is important that the survey questions mimic reality as much as possible. It is essential that the questions relate to the key attributes of homes in the local context. A focus group discussion was conducted with 20 tenants, who were recruited by convenience sampling, to identify the most important factors for residential choice. 'Levels' were then assigned to these attributes based on the prevailing circumstances of the study area and they can be seen as discrete differences or choices for tenants. These levels are presented in Table 1 for each key attribute.

Table 1 Assignment of Levels to Variables

Attributes	Levels
1. Rent	5% rent discount
	10% rent discount
	15% rent discount
	20% rent discount
	10% rent increase
2. Building Services	24 hours electricity and water supply
	8 hours of electricity and water supply per day
	24 hours of electricity and 8 hours of water supply per day
	8 hours electricity and 24 hours of water supply per day
3. Grave	Grave at the front of the building
	Grave beside the building
	Grave at the backyard
	Grave within the dwelling
	No grave
4. Accessibility	15 minutes by bus to work and local services
	30 minutes by bus to work and local services
	15 minutes to work and 30 minutes to local services by bus
	15 minutes to local services and 30 minutes to work by bus
5. Compound Size and Fencing	Large compound no fence
	Large compound with a fence
	Small compound with a fence
	Small compound no fence
6. Room Size and Ventilation	Double bedroom with cross ventilation
	Double bedroom with no cross ventilation
	Single bedroom with cross ventilation
	Single bedroom with no cross ventilation

Stage 2: Survey Design

The aim of the survey was to ask respondents to choose between sets of realistic housing options that are applicable to private tenants in Akure. These choice set scenarios were established through the steps set out below:

i. Choice task

Respondents were given combinations of housing options, involving the key attributes or variables listed in Table 1, and asked to express their preference. These are known as ‘choice tasks’, and an example is shown in Figure 1. The choice task was framed as choices between homes with different attributes known as ‘concepts’ from which respondents are expected to select. Each housing option/concept is defined in terms of accessibility, building services, compound size and fencing, grave/location, room size/ventilation and rent/discount.

The questionnaire was designed with due consideration for the theoretical steps and methods involved in a stated choice experiment as put forward by Orme (2006, 2009). He argues that a researcher should ask a respondent to decide on between 8 and 15 choice tasks. This helps to ensure unbiased opinion among respondents as too many random tasks could lead to boredom and inconsistencies of opinions. In order to avoid bias each respondent was given 10 choice tasks to assess.

ii Method of Generating the Choice Task

Not all respondents were given the same set of choice tasks. To ensure that each choice concept in the choice task has a good statistical quality, the study presented a design that is ‘orthogonal’. To achieve this, the balanced overlap method was applied. The method facilitated equal frequency of occurrence of attributes and levels on the choice tasks generated. This enabled the tenants to give more thoughtful responses and hence provided a base for a stronger estimation of possible interaction effects.

iii. Attributes’ Randomization

To control for any order effect, attributes were randomised to make sure that they occur in a different order to each respondent in different choice tasks. This helped to reduce error and bias in concept selection.

iv. Concepts per Choice Task

If there are too many concepts (combinations) to choose from respondents can have difficulty managing the number (Iyengar & Lepper 2000). To overcome this challenge, Louviere (1991) and Orme (2006) advise that it is reasonable to include between 3 and 5 concepts per task. With

this advice, three choice concepts per task and a none-option were included in each task (see Figure 1).

Attributes	House 1	House 2	House 3	None
<i>Rooms Size and ventilation</i>	Double bed size room(s) (100 sq ft,) no cross ventilation	Double bed size room (s) (100 sq ft), cross ventilation	Single bedroom (s) (70 sq ft), cross ventilation	I wouldn't choose any of these, I will keep looking for a suitable house.
<i>Accessibility</i>	15 minutes to work and 30 minutes to local services by bus	30 minutes bus to work and local services.	15 minutes to local services and 30 minutes to work by bus	
<i>Building services</i>	Stable electricity and water supply	Unstable electricity and stable water supply	Stable electricity and unstable water supply	
<i>Grave</i>	No grave	Grave within the dwelling	Grave at the backyard	
<i>Compound Size and Fencing</i>	Small compound with fence	Small compound no fence	Large compound with fence	
<i>Rent</i>	5% discount	20% discount	15% discount	

Figure 1 A Sample of a Choice task with Four Choice Concepts

v. Fixed Tasks

The reason for including a fixed choice task is for internal validation of the model estimates and as a control experiment. According to Adamowicz *et al.* (1998) the none option also helps to ensure consistency with market reality where respondents are not forced to rent any property that they are not satisfied with.

Stage 3: Questionnaire Survey

The core of the study comprises a questionnaire survey of tenants undertaken to assess their experience and views on the impact of a grave within residential accommodation. As these graves are only located in housing within the customary or informal sector, the survey was

restricted to these neighbourhoods. The required sample size was determined by reference to the number of preferences required for the statistical analysis. An ordinary least squares logit simulation exercise was used to determine the required sample size using Sawtooth software (Orme, 2009). On the basis of this exercise a sample size of 300 was deemed to give statistical estimates that would be statistically significant.

The questionnaire survey aimed to achieve a cross-section of households across the income spectrum to enable reliable inferences to be made about its influence. Given the predominance of low and middle income groups in the study area probabilistic random sampling would not be appropriate for the survey as it would not guarantee the inclusion of a representative sample from each income group in the study. A non-probabilistic sampling method was adopted to avoid sampling error. In particular, the study applied a quota-sampling technique to avoid infiltration of bias into the expected data. This was achieved by assigning and selecting respondents from different neighbourhoods. The informal residential areas in the city were divided into 10 districts. The final number of respondents was evenly distributed across 7 of these residential districts while the numbers of respondents in the remaining 3 districts were slightly higher. These 3 districts made up the differences where the targeted numbers of respondents were unmet. In all, a total of 300 tenants were interviewed, with 'low', 'middle' and 'upper' income groups represented in the sample. The questionnaire survey was personally administered with the help of five research assistants.

Stage 4: Data Analysis

The data from the survey were a set of discrete household preferences between types of housing defined in terms of accessibility, building services, compound size and fencing, grave/location, room size/ventilation and rent/discount. These preferences also included a 'status quo' option. The data analysis here is focused on the role of rent discounts in shaping these preferences towards graves located in a home.

The first step was to estimate the utility/disutility or willingness to be compensated for a grave in a home. These utilities were estimated via a hierarchical Bayesian multinomial logit model from the 3000 choice tasks derived in turn from the survey. The estimated utility values of the 300 tenants are then inputted to a multiple regression model to examine tenants' sensitivity to a reduced rent in a home with a grave. The dependent variable is the utility derived from a

housing choice while the independent variables were the discount levels. The sensitivity explains a tenant's acceptability of a certain discount and was denoted by the beta coefficient. Finally, the analysis validated tenants' sensitivity to lower rent on homes with a grave predicted from the regression model using scatter line plots comparing the values derived from the respondents' observations.

Results

The findings of the survey reveal the following negative impacts on households. Some 27% of the respondents experience a negative psychological effect due to the presence a grave in a home nearby. This is followed by 25% that noted that a grave in a house affects their thought process. While 17.7 per cent could not explain the negative effect of the sight of a grave in a residential property, 8.7 per cent say it affects the level of aesthetic desire in a home. On the other hand 21.7 per cent of the tenants say that the location of graves in their homes has no negative effect on them.

The estimated positive and negative average utilities of living with or without a grave are shown in Table 2. As noted above they are derived from a multinomial logit model, represented by the equation

$$P1 = \frac{e^{v1}}{\sum_i e^{vi}} \quad \text{equation 1}$$

where:

P1 = the probability of choosing alternative 1

e = error term

v1= alternative 1

vi= deterministic utility

It is a zero centred part-worth model so the strong positivity of a home with no grave is demonstrated by the value of 1.97. Respondents are tolerant to renting residential property with a grave in the backyard but strongly against a grave located within the physical structure. Most tenants spend more time in their rooms, front of the house and at the rear than the sides thus explaining the possible rationale behind the declining effect in that order. The reliability of the estimated effect is demonstrated by the corresponding standard errors that are low and within a reasonable range to establish precision of the measured effects.

Table 2 Estimated Utility Effects for a Residential Property with and without a Grave

Variable	Effects	Std. Error	T Ratio
Grave at the front of the building	-0.18	0.07	-2.47
Grave besides the building	-0.26	0.08	-3.39
Grave in the backyard	0.12	0.07	1.71
Grave within the room	-1.65	0.15	-10.98
No grave	1.97	0.06	33.40

Given the general disutility associated with graves in a home the analysis now considers tenants' sensitivity to a potential rent discount as compensation. For simplicity this analysis is based only on graves located at the front of the building. As noted above this task is undertaken by multiple regression analysis. The levels from the experimental choice experiment are the independent variables as set out in equation 2.

$$y = \beta_0 + \beta_1(\chi_1) + \beta_2(\chi_2) + \beta_3(\chi_3) + \beta_4(\chi_4) + \varepsilon_i \quad \text{equation 2}$$

where:

$y = \text{utility}$

$\beta_0 = \text{intercept}$

$\beta_1 = \text{coefficient of discount 1}$

$\chi_1 = \text{discount (5\%)}$

$\beta_2 = \text{coefficient of discount 2}$

$\chi_2 = \text{discount (10\%)}$

$\beta_3 = \text{coefficient of discount 3}$

$\chi_3 = \text{discount (15\%)}$

$\beta_4 = \text{coefficient of discount 4}$

$\chi_4 = \text{discount (20\%)}$

$\varepsilon_i = \text{random error}$

The estimated β coefficients correspond to tenants' sensitivity at different rent discounts, and are presented in Table 3. These sensitivity values are validated by low standard errors and high t-statistics recorded on all the values. Similarly, the P-values show that the model's outcomes

did not occur by chance occurrence. The regression analysis outcomes also satisfy three assumptions that are necessary for the reliability of model predictions. First, the Gauss Markov assumptions, which show that the model is true holds. Second, the reliability of the estimated coefficients is statistically significant. Third, all other independent variables in the model are constant. Further the overall accuracy of the regression model given by the adjusted R square value is 80 per cent.

Table 3 Estimation of Sensitivity (β) Coefficients to Changes in Rent Discount

	<i>Coefficient</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	-4.60	0.15	-30.2	2.64E-92
-5% discount	1.10	0.11	10.4	1.18E-21
-10% discount	2.11	0.11	19.8	6.49E-56
-15% discount	0.29	0.13	2.3	0.02
-20% discount	1.09	0.12	8.8	1.26E-16

The implication of this β_1 coefficient is that, if a residential property with grave is offered for let with a 5% rent discount tenants' elasticity of demand for it would be 1.10. This implies that tenants' price sensitivity is slightly above a proportionate change with respect to change in rent at this discount. For a 10% discount in rent the responsiveness is 2.11, which means that the price sensitivity is elastic at this level. Conversely, a 15% discount in rent produces less than a proportionate inelastic change of 0.29. However, with a 20% discount, the responsiveness is slightly above a proportionate change with a price elasticity value of 1.09. As shown in Figure 2, movement along the sensitivity curve shows no direct relationship with the size of the rent discount.

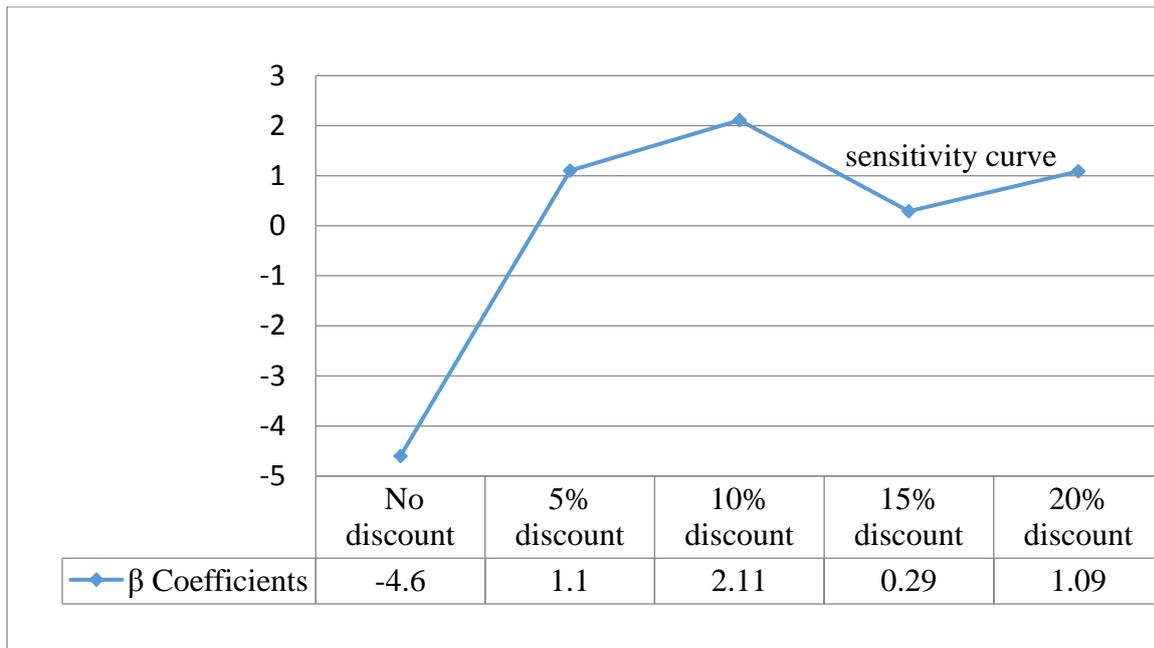


Figure 2: Sensitivity to rent discounts in a home with a grave

Validation of Tenants' Sensitivity based on Model Forecasts

This subsection validates the β coefficients by comparing forecasts with the values actually obtained from the respondents' observations (derived from the multinomial logit model) using a scatter line plot. A line of fit is estimated for each discount level and the slope of the equation is the predicted utility from residential properties with a grave. As shown in Figure 3, tenants' sensitivity with respect to a 5% rent discount on a property with a grave is -0.34. This implies that the tenants' sensitivity to a 5% rent discount is inelastic.

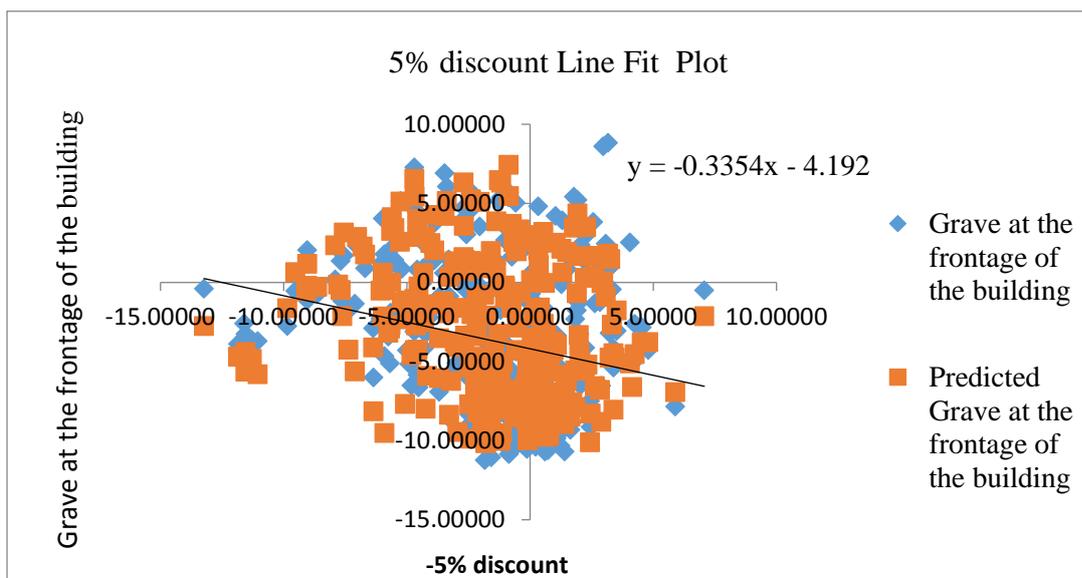


Figure 3: 5% Discount Line Fit Plot

We analyse tenants' sensitivity to a 10% rent discounts in the line fit plot and find that responsiveness to it is 1.90. This means that demand is elastic at a 10% rent discount for a home with a grave as shown in Figure 4.

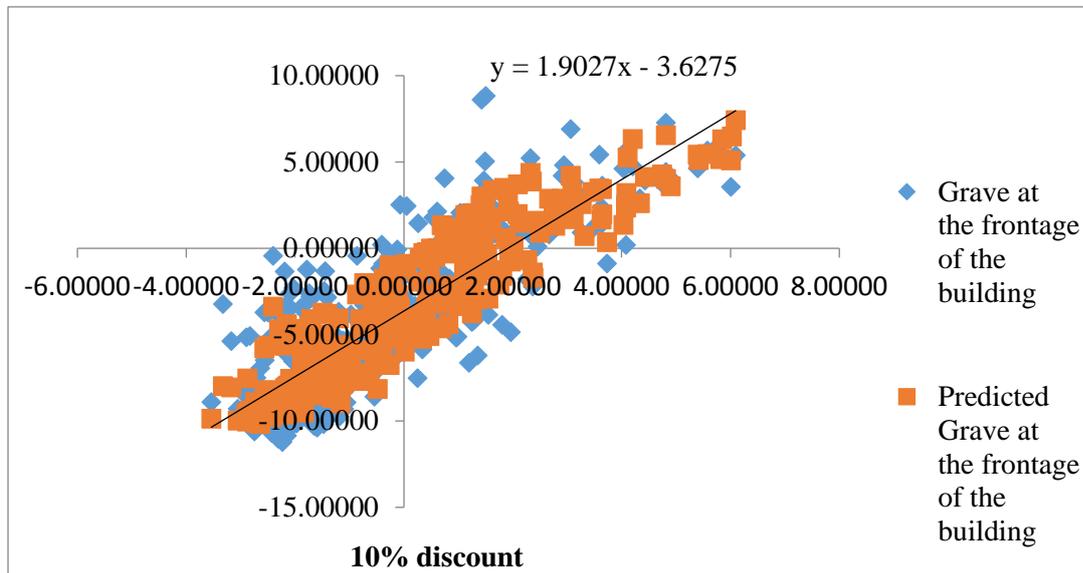


Figure 4 10% Discount Line Fit Plot

For a 15% discount in rent, a negative trend line gives a sensitivity value of -0.28 is observed as shown in Figure 5. The elasticity is less than one in absolute terms. It implies that demand at a 15% discount in rent on a home with a grave is relatively inelastic.

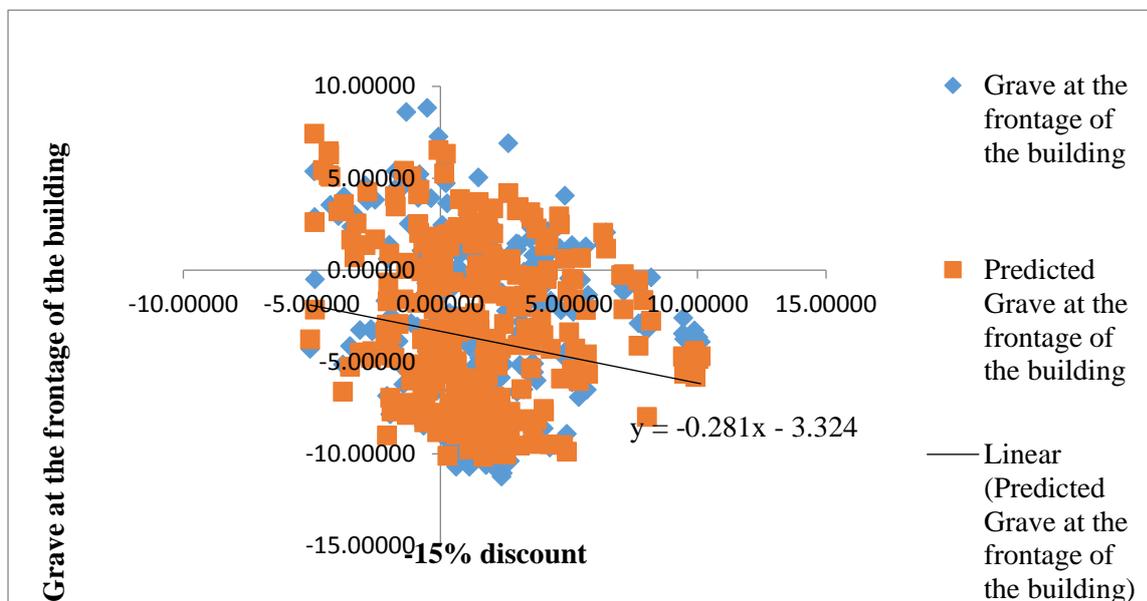


Figure 5 15% Discount Line Fit Plot

As shown in Figure 6, the responsiveness of a tenant to a change to a 20% rent discount is 0.50. Although the sensitivity of demand to this highest possible discount on rent in this choice

process is positive it is relatively inelastic. This implies that respondents are not highly sensitive to a large discount in a home with a grave.

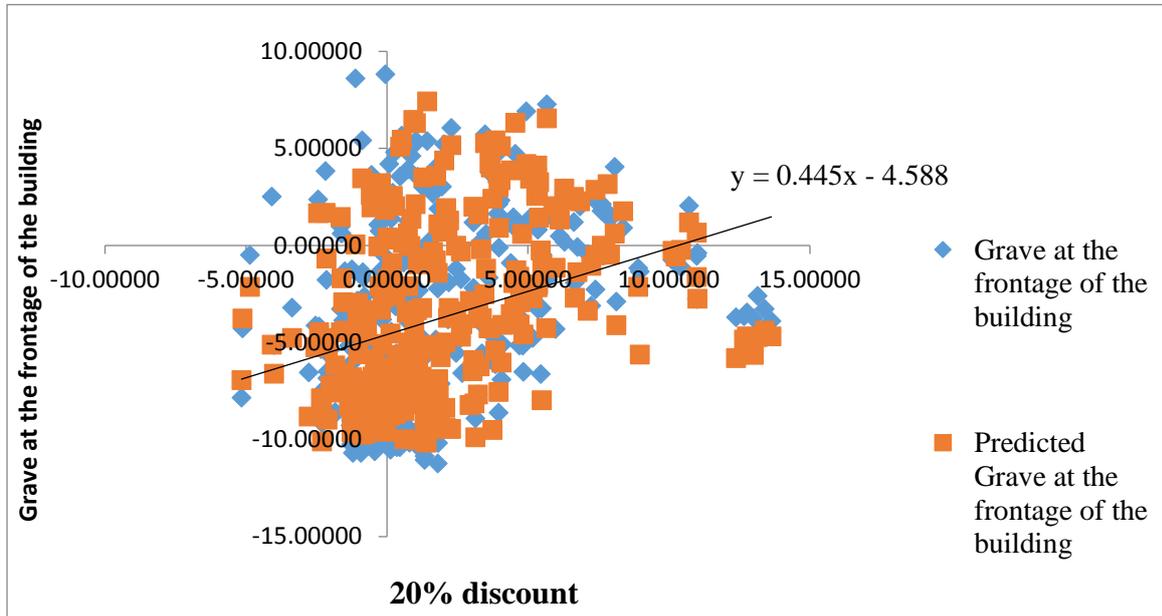


Figure 6 20% Discount Line Fit Plot

As shown in Table 4 the predicted sensitivities on each rent discount are close to the observed values from the respondents' observations. Hence, the low residuals corroborate the validity of the sensitivity values. Further, the normal probability curve substantiates the model fit. As shown in figure 7, the error terms are normally distributed as there are no outliers. From both points of view, the findings show that the sensitivities display non-proportionate trends relative to a reduction in rent. While sensitivity to a discount is elastic at 10% discount in rent, it is inelastic from both perspectives at 15 per cent. The observed sensitivity coefficient is slightly above unit elastic at both 5 and 20%; implying that both reductions in rent produce similar motivations to lease a private home with a grave.

Table 4: Forecast and ‘Observed’ Sensitivities to Rent Discounts

Rent Discount	Forecast Elasticity (Line Fit Plots)	Observed Elasticity (Multinomial Logit Model)
5%	-0.34	1.10
10%	1.90	2.11
15%	-0.28	0.29

0.46

1.09

20%

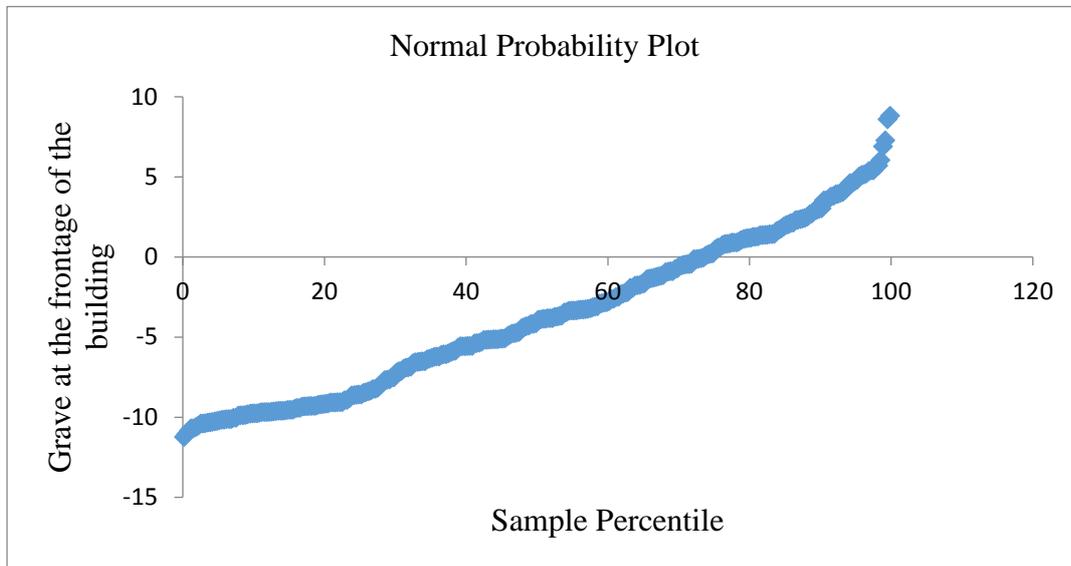


Figure 7 Normal Probability Plot for the Fitness of the Data

These results demonstrate the heterogeneity in consumer choice behavior but suggest that the loss of welfare from a grave located in the front garden can be equivalent to between 15 and 20 per cent of the open market rent. However, there are some inconsistencies in the sensitivities to these discounts. The reasons are not clear but may be caused by the different characteristics such as household socio-economic- demographics within the survey. In addition income is an important constraint and it is missing from the choice experiment. The survey distinguished between high, middle and low income groups. It is useful to note how these different groups of tenants stated they would respond to the location of a grave in their home.

High income tenants were generally able to actively respond to a landlord placing a grave in their home, in fact the survey finds that 35 per cent would move home as soon as their current lease expired, while 52 per cent would move home before their current lease expired. Only 14 per cent of these respondents would continue to occupy their home. In contrast tenants 27 per cent of the middle income group would remain. Amongst the low income group 44 per cent indicate they would stay if a grave was located within it. Given that high income groups only represent 10% of the sample with middle income tenants 46% and low income groups 44% overall some 32 per cent of tenants will suffer the long term disutility of a grave within their home.

Discussion and Conclusion

The paper has assessed the impact of a negative externality and planning failure in the Nigerian city of Akure. In particular it considers the disutility to neighbours created by the tradition of burying the dead in graves in houses. The housing market context is housing shortages and ineffective planning, with the majority of households who are private tenants living in an informal sector with weak property rights. The result is that the role of choice influencing market forces is limited, and indeed for many households their housing options are heavily constrained.

In these circumstances the standard academic approach of hedonic modelling to externalities is not applicable, because its underlying assumptions of an efficient market do not apply and households' market behaviour is highly constrained. No market transactions data are also available. The research presented therefore takes a stated preference approach based on a survey that asks respondents to express housing preferences through a series of specially selected scenarios, known as choice tasks. Using this data, equivalent to a map of tenants' preferences, the study first examines the utility/negative utility derived the location of a grave in or near a home.

The paper then examined the scale of the rent discount required to compensate tenants for the location of a grave within the bounds of their home. The study is based on 300 tenants and tests tenants' sensitivity to discounts between 10 and 20%. The results are based on a choice experiment that by its very nature has a degree of artificiality but also has benefits over the data requirements and assumptions of traditional methods. This research approach offers a way forward for the analysis of third world property markets where there is an absence of formal transactions data.

The findings of the study suggest that the loss of welfare from a grave located in the front garden is the order of between 15 and 20 per cent of the open market rent. However, there are doubts whether this is reflected in prices, in other words the negative externality is not likely be internalized in market rents. There are a number of reasons. First, because there are some inconsistencies in the sensitivities to these discounts. Second, the informal nature of the market means that it is unlikely to operate efficiently. Third, it seems that rather than negotiate a

potential reduction in rent, high and middle income tenants prefer to move as soon as practicable. It implies the cost of a grave in home cannot be fully or even partially internalised by the tenant. Further it seems that low income tenants are constrained to accept the imposition of a grave without the market power to negotiate a discount.

The research demonstrates that the practicality of a 'market' solution as a remedy for tenants' loss of welfare in this instance is doubtful given the market conditions of a typical African city. The finding is consistent with Steinacker (2006) who notes that financial compensation is not an acceptable solution to negative externalities in the residential property market. He argues that such economic approaches fail to acknowledge that solutions are contingent on people's acceptance. The policy implications of the findings suggest that the welfare of tenants are ignored by a planning failure that is typical of African cities, while the sustainability of the residential environment for posterity is in jeopardy. Graves are only one externality in such rapidly growing cities, and part of a broader range of such issues encompassing pollution and waste control. The lack of a market 'solution' to graves is part of a wider imperative for effective planning and environmental management in African cities.

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