

The Impact of Urban Regulation on Informal Settlements in Nigeria

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Abstract

The paper evaluates the effect of regulation on the number of households living in informal settlements. Initially, a profile of the regulatory climate and urban informal settlements in Nigeria is presented using Lagos State as an example. Subsequently, econometric analysis is carried out using the MIMIC model to estimate the impact of determinants and the size of the informal sector in each area. Given the results of the analysis, it is argued that since households are mobile within the country, an increase in regulation and enforcement in a region decreases the size of informality in that region. However, informality in regions with less regulation is higher.

Key Words: Informal Housing, Nigeria, Lagos State, Urban Planning, MIMIC Model

1. Introduction

In countries where institutions are weak, rapid urbanization often leads to an increase in informality as the growing population puts pressure on available resources. The housing sector in Nigeria is characterized by a large informal sector, which is dominated by the urban poor. The population of Lagos State has grown rapidly in the decades following independence in 1960, primarily due to rural-urban migration. However, housing supply in the formal sector has not grown accordingly. Lagos State, the commercial capital of Nigeria, is home to over 6% of the country's population¹. With a population density of 20,000 persons per square kilometer, Lagos State is faced with issues including but not limited to overcrowding, inadequate infrastructure and unregulated urban sprawl.

Renewed government focus on the housing sector has inspired academic interest in housing. The Vision 20-20 housing report outlines the government's commitment to developing the housing sector by providing finance, improving the legal and regulatory framework and reducing the cost of production in order to increase housing availability particularly for the urban poor. However, in Lagos for instance, policy responses to the housing problem have included renewed focus on public housing provision, slum clearance, adjusting the regulatory climate by standardizing the regulatory framework, updating urban planning policy and streamlining land use charges. However, regulation and enforcement are often focused on high-income areas where informal settlements are considered to be an urban blight.

The literature on the informal sector and informal housing is vast and wide in scope. The literature covers several subjects including; the individual decision of informality, the characteristics of the informal sector in general and in specific economies, the determinants of informality and measurement of the informal sector. This paper focuses on the effect of regulation on informality in a developing country where enforcement is weak. Several works have addressed this question using either cross-national data or time series data from a specific country. To name a few, Loayza (1997), Schneider (2005) conclude that the regulatory burden incentivizes informality especially when enforcement is weak. However, Souza (2009) presents a different argument based on subnational analysis. The paper examines informality within a city and thus determines the effect of imbalanced regulation where households are mobile. Souza (2009) observes that regulation puts upward pressure on the price of formal housing and as housing prices increase in one location the size of the informal sector decreases in that area. However, within the same economy, informality in other areas with less regulation increases.

In this paper, I look at distortions in the housing market caused by time-consuming and rigid regulatory requirements that make investment in informal housing preferable to investment in formal housing in spite of associated risks of informality. However, at the local level households are mobile so when regulations and enforcement are imbalanced across regions, the informal sector relocates accordingly. Thus, I will evaluate the conclusion of Souza (2009) that formal regulation (through formal housing prices) influences the spatial location of informality. In order to conduct this analysis I will first

¹ Within Lagos, an area known as Metropolitan Lagos that covers 37% of the landmass of the state is occupied by 85%

present a profile of the housing market in Lagos. Secondly, I will evaluate the regulatory climate and summarize estimates of the time and financial cost of acquiring formal housing through the existing legal system. Third, I will estimate the impact of regulatory requirements on the size of the informal housing sector in Nigerian States based on a modified version of Loayza's model of informality in industries.

2. Literature Review

The literature on informal housing addresses various aspects of informality at the national, regional and subnational levels. The literature takes several forms; the first of which aims to qualitatively describe characteristics of the informal sector and determine the determinants of informality. Hernando de Soto analyzes direct and indirect costs of the housing decision and concludes in particular that regulatory costs serve as a deterrent to formality in the sector. In his book; *The Other Path* (1990), Hernando de Soto illustrates informality as an economic decision determined by individual appraisals of the cost and benefits of formality compared to informality. Malpezzi and Sa-Aadu (1996) evaluate housing policies in Africa and make a case for discontinuing direct public intervention in the housing market in favor of private sector production.

Secondly, the literature includes models that illustrate the characteristics and determinants of informality. Loayza (1997) introduced a model of informality based on this cost-benefit analysis but the model focuses primarily on aggregate production. Models specifically pertaining to the housing market have also been developed. Annez and Wheaton (1984) demonstrate a methodological improvement to housing market models that includes some measure of the size of the informal housing market and illustrates its relationship with economic development and demographic changes. More recently, Maria Souza (2009) examined the effects of land use regulation on housing prices and further evaluated the relationship between the price of formal housing and the stock of informal housing in 13 municipalities in Curitiba, Brazil.

Thirdly, literature on informal housing aims to estimate the size of the informal market or the size of various parameters using various direct and indirect methods. Recent works include; Kapoor and Le Blanc (2004), which estimates the risk on housing investment in the informal, market using data from Pune India. Additionally, several works estimate the size and location of informal settlements in various countries using satellite images (Seitchiping 2005).

Works focusing on Nigeria generally fall into the first category providing a qualitative assessment of the informal housing sector. The lack of aggregate data and the difficulty in obtaining data contributes to a heavy reliance on surveys, spatial models and qualitative assessments when studying the informal housing sector in particular.

3. The Housing Situation in Nigeria: The Case of Lagos State

3.1 Housing Demand

The primary demand drivers include a high urban growth rate and the rise of the middle class. Based on an estimated rate of demand of 9 housing units per 1000 (Ekweme, 1979;

Iyagba et al,1998) of the population each year, the country needs to produce 1,462,236² housing units per annum to bridge the housing gap. However, housing affordability particularly for the urban poor is a primary issue cited in government and academic discourse. The lack of housing financing options in terms of government subsidies, formal credit and mortgage services, contributes to the prevalence of rental housing in Nigeria. Specifically, 75.8% of households in Lagos rent as opposed to the 18.2% own their housing unit.

3.2 Housing Supply

In order to understand the various factors that affect the supply of formal housing in Lagos, it is important to outline the primary groups of providers.

3.2.1 The Public Housing Legacy

Public response to the housing shortage in Nigeria has undertaken different forms over the years. Several demand and supply-side constraints have been addressed. The provision of credit facilities has been the primary demand-side intervention. However, the majority of policies have been supply-side interventions. Supply-side interventions include direct provision, policies to encourage private sector supply and public-private partnerships. Successive governments have implemented these interventions through different housing corporations; the most successful of which is the LSDPC. Several studies including Abiodun (1976), Awotona (1987), Osuide (1988), Aluko (2012), evaluate the impact of public housing in Nigeria (See Appendix 1 for summary).

The literature on public housing suggests that the government has been ineffective at meeting the housing needs of the population. In each of the National Development Plans, proposals were made to contribute towards closing the housing gap but in the best case less than half of the targeted number of units were produced (Appendix 1). Furthermore, the units provided were unsatisfactory in terms of management and maintenance (Jiboye 2009). In addition, housing initiatives focused on providing owner occupied housing despite the high rate of leasehold in Lagos. Awotona (1987) argues that public policies failed to protect private tenants and therefore improve access to housing through rent legislation and control. In terms of mortgage initiatives, high income households are the primary benefactors of loan facilities offered by the Federal Mortgage Bank because of the high financial cost of the initial deposit requirements and other regulatory requirements (Awotona 1987; Osuide 1988).

Ilesanmi (2010) makes a case for mixed public housing concluding that although public housing schemes are a fiscal burden they are more successful at addressing the housing needs of low-income groups based on an evaluation of LSDPC housing schemes. Ikejiofor (2005) argues that the assessed inefficiency of public housing schemes in terms of high delivery costs and limited impact informed a review of housing policy in 1991 that emphasizes and facilitates private sector-driven developments. As a result,

² Based on the 2011 World Bank population estimate: 162,470,737.

government involvement in the housing supply has declined in recent years with public-private partnerships dominating the landscape.

Public sector contribution through Public Private Partnerships (PPPs) was initially limited to the vetting of qualified property developers, provision of land, and infrastructure with the joint responsibilities of marketing and allocation (Ibem 2010). The adoption of Public Private Partnerships (PPPs) as a strategy to address the housing gap has been unsuccessful in increasing housing infrastructure available to the urban poor (Ibem 2011). As a result, in Lagos State, the Fashola administration has renewed focus on direct public production of informal housing.

3.2.2 Private Sector Contributions

In Lagos, the private sector provides 83% of the urban housing stock in the city (Federal Office of Statistics, Lagos 1983)³. However, the State estimates that at the current population growth rate 240,000 units need to be supplied yearly to close the current housing gap (PISON). Rapid urbanization and high population growth rates, high costs of building materials, improper coordination of public agencies and laws, inefficient bureaucratic processes and inefficient physical planning have been cited as some of the reasons for shortages in housing supply in relation to demand (Akinmoladun, Oluwole 2007). The private sector in the housing market comprises of three primary suppliers; firms, households and property developers.

As part of a strategy to increase housing supply through public-private initiatives, the government of Lagos State mandated that firms in all industries with over 500 employees provide housing for their staff. Large companies such as Shell, Chevron etc. have provided housing for their staff in various regions in the city. In the traditional system, families with means developed housing units and supplied housing to the market. In all income groups, families still develop the residential property that they occupy and offer units for rent or sale both in the formal and informal economy.

Property developers can stream line the bureaucratic and direct costs of owning a house by developing housing units en masse and transferring property rights. In Lagos, property developers primarily develop properties in an estate format with similar housing units. Thus, property development companies provide a significant portion of middle-income homes as they can minimize costs by spreading the costs of administration and construction across several units and extend these benefits to consumers. These units are particularly attractive to the middle class because they spare households the time and financial cost of developing their own property. Furthermore, sites and services developments are growing in popularity. In this case, the developers provide and maintain basic infrastructural facilities such as roads, water, electricity, sewage, etc. The costs of these facilities are then added to the eventual selling prices of the property. This is attractive because of the inadequacy of government services.

³ Aluko 2012 and PISON consulting estimate 90% private sector contribution to the housing stock for the entire state.

4. The Formal Housing Market

Loayza (1997) defines the informal economy as a process of income generation characterized by one central feature: it is unregulated by the institutions of society, in a legal and social environment in which similar activities are regulated. For the purposes of this study, the formal housing market is defined as residential property for which the acquisition, development and allocation of property rights complies with regulatory requirements. Therefore, ownership of formal housing is defined as a residential property with approved building plans, for which the owner or occupant has rights to the land and performs the legal requirements to maintain the property. In the case where property is rented, legal rental status is achieved when the registered owner of the property issues a lease to the occupant.

4.1 Costs Accessing the Formal Housing Market

The costs of formality in the Lagos housing market can be subdivided into three broad categories: Bureaucratic requirements, regulations and taxes. In particular, bureaucratic requirements and regulation comprise the financial and time costs of entry into the formal housing market while taxes are the primary cost of maintaining ownership in the formal housing market. These costs affect both the quantity of housing supplied in the market and the rate at which housing assets become available.

The major bureaucratic requirements necessary to supply housing in the formal market are an attestation of property rights to the land in question and a building plan approval to guide construction. Three central features of the regulatory system in Nigeria contribute to its inefficiency. First of all, a lack of standardization of processes, regulatory bodies and a lack of stability between regimes make it difficult for the public to adjust. Thus, a lack of education on regulatory requirements and general antipathy is common. Secondly, inadequate resources (in terms of physical and human capital) for monitoring the market and enforcing regulations contribute to lengthening administrative processes and supporting non-compliance. Finally, regulatory requirements are considered to be excessive in terms of the financial and time cost involved, penalties levied, and other direct implications of pertinent laws.

4.1.1 Land Ownership

Rights to land are granted by the state government according to the Land Use Act of 1978. The Act declared that all land in the country be vested in the governor of that state replacing traditional rulers as the trustees of land (Aluko 2012). The land use decree was put into place to encourage equitable access to land, reduce speculation, improve the process of land administration and tenure security (USAID 2010). Ultimately the Act was to make it possible for land to be put into building production more rapidly for both public and private property (Taylor 1998).

According to the provisions of the Act, rights to land can be certified through several conventional and unconventional processes. Agbola and Agunbiade (2009) provide a summary of the conventional and special administrative processes through which land can be acquired legally in Lagos State.

Conventionally, land can be acquired in two ways; by obtaining a Certificate of Occupancy or by obtaining the Governors consent. The Land Use Act allows citizens to hold a statutory or customary interest in the land certified by the Certificate of Occupancy. This right of occupancy is statutory when it is granted by the Governor and customary when the Local Government grants it in a rural area. The Governors' consent is necessary to legally transfer all or part of a statutory right of occupancy by assignment, mortgage, transfer of possession, sublease or otherwise (section 22 of the LUA).

Special title registration processes are applicable to 4 categories of special cases; Private Developer Scheme, Village Excision, Ratification, and the final applies to areas identified as "special districts". These special cases are intended to encourage formality in the housing sector by recognizing traditional and unconventional settlements and by granting property rights to existing informal settlements. In cases where property rights were previously allocated, the government must compensate any agents with legal interests in the land before taking possession and allocating titles to the present occupants.

The Private Developer Scheme applies to corporations required or willing to provide staff housing and registered real estate development firms that develop land for distribution on a site and services basis⁴ or through direct sale. Village excision and ratification apply to land acquired by the government for future development. In the case of rural land, village excision provides legal rights to an identified village population permitting development of rural land by the villagers. In the case where the acquired land is closer to the urban center increases in the urban population may lead to an increase in the value of peripheral land parcels thereby encouraging illegal transfer and development of the land. In order to prevent unplanned physical development, the government levies certain fees on the occupiers formalizing their titles thus allowing for creation and enforcement of urban planning guidelines.

Literature on the impact of the conventional methods of land acquisition reveals the direct and indirect costs of legal land acquisition. There are three pertinent direct implications of the ACT. The first implication is financial; applicants must pay a series of fees including a file opening fee, an application fee, survey fees, publication fee and capital contribution fee, in addition to the costs of completing the necessary requirements to apply (USAID 2010, Appendix 2a). High bureaucratic costs also characterize the process of land transfer. The second and third implications are related to regulatory cost. Secondly, registration under the Land Use Act places the certificate holder on the tax rolls and imposes a ceiling on land holdings⁵. Furthermore, the Act declares that state officials can nationalize land and recover customary and statutory land rights in accordance with applicable law and upon payment of compensation (RON Constitution 1999; RON Land Use Act 1978). However, expropriation of land in Nigeria is at the discretion of government officials thus facilitating corrupt practices including

⁴ Site and Service is a form of planning intervention where governments or individuals acquire large tracts of land, sub-divide them into buildable plots, and provide basic infrastructural facilities such as roads, water, electricity, sewage, etc. The costs of these facilities are then added to the eventual selling prices of these plots.

⁵ The Act imposed a ceiling on urban and rural landholdings: no individual can hold more than 0.5 hectares of undeveloped urban land, 500 hectares of non-urban land, or 5000 hectares of grazing land.

compulsory land acquisitions for lucrative private sector development and delays in payment of compensations (if at all) (USAID 2010). Finally, in order to apply for a certificate of occupancy, individuals are required to provide proof of participation in the formal market in form of an income tax receipt (Appendix 2a).

Due to bureaucratic inefficiencies involved in obtaining the necessary property rights, the system has been more restrictive than was intended (Aluko 2012). Firstly, failure to properly inform the public on the provision of the Act has led to incomplete implementation such that many rural citizens still follow traditional land laws (USAID 2010, Williams 1992; Kuruk n.d.; Olaywola and Adeleye 2006). Secondly, bureaucratic requirements are both expensive and time –consuming. An analysis of the process of acquiring a certificate of occupancy reveals that applicants are required complete a minimum of 11 requirements before undergoing the 8 stage reviewing process that takes an average of 6 to 9 months to complete (Appendix 2a, USAID 2010). Thirdly, lack of enforcement has led to a large and growing informal land market governed in many cases by traditional law, illegal transfers of land leading to disputes over land transactions and clandestine speculative practices (Olayiwola and Adeleye 2006; Dada 2010, USAID 2010)

4.1.2 Building Plan Approval

In order to construct a property, the building plan for the development must be approved according to urban planning policy for the particular region in the state. This is required for all development including government projects. The State Government suggests that applications are processed in 30 days, however, due to the intricate channel of approvals each application undergoes and staffing shortages at the District and Local Planning offices these applications on average take 3 months to be approved. In addition, applicants are required to submit a minimum of 13 different items from various public and private institutions including but not limited to LUAC, Drainage, Urban Renewal Board, NEPA and Fire services (Appendix 2b).

4.1.3 Regulation

Regulations that govern the housing market control the primary uses, the manner of development and the allocation of land resources. Urban planning regulations govern the allocation of land according to primary economic purposes; commercial, residential, government, infrastructure etc, the spatial location of public services, the type of developments permitted in each individual location, all of which can ultimately contribute to housing prices therefore determining regional demographics.

In Lagos, the Ministry of Urban Planning is the governing body. Applications for developments are assessed by branches of the ministry based on urban planning requirements, which are drafted and approved for each local government area. All the same, the urban regulation system has been ineffective at enforcing policies and preventing unregulated urban sprawl in Lagos State for various reasons. As Lagos State grows, the lack of effective monitoring and enforcement of urban sprawl particularly in low-income areas has led to the uninhibited development of unplanned settlements,

conversions of residential space for commercial use and a general disregard for urban planning concepts.

Moreover, the lack of preemptive policy making creates disincentives to complying with urban planning requirements. In the period when initial urban planning regulations for Lagos State designed, the growth rate of the state never exceeded 3.3%. However, post-independence, the population growth rate increased to about 14% per annum and rests today at about 5% (Abiodun, 1997).

Yet, even for high-income neighborhoods, urban planning regulations were left unrevised for the several decades. In particular, the trend persists in Ikoyi and Victoria Island where the city's elite and a growing service sector are based. The urban development plan for Ikoyi and Victoria Island were revised and approved in 2005, decades after original development schemes for Ikoyi was approved in the 1940's and that for Victoria Island was approved in the 1960's. This has been the first of a few such revisions proposed for all districts. Urban planning regulators often neglect low-income neighborhoods making them attractive sites for informal, unplanned urban sprawl.

The failure to address the needs of the urban population in relation to available land through preemptive urban planning regulation has led to several outcomes. Primarily, the demand for land for various purposes and the consequent effect on prices is not accounted for in urban planning policies. An interview with a property development firm⁶ revealed that plans to develop an estate in Apapa were canceled following a profitability assessment that revealed that it would be more lucrative to sell the land than to develop the maximum residential units permitted on the land. Thus, urban planning policy in Apapa does not reflect the increase in price of land creating incentives to developing the land without obtaining the necessary urban planning approval.

Ineffective monitoring and enforcement systems have contributed to compounding the problem. The most evident manifestation of enforcement failure in this sector is the unmonitored conversion of residential property into commercial property. Areas such as Awolowo road in Ikoyi and parts of Victoria Island were allocated primarily for residential purposes. However, as the needs of the economy and the population changed these properties were renovated for commercial purposes. However, infrastructure such as roads and parking were not adjusted to accommodate this change creating traffic bottlenecks in various parts of the city.

4.2 Costs of Remaining in Formal Housing Market

In order to face the dual challenges of rising population growth and declining federal revenue allocation, the Lagos State government has had to readjust its fiscal profile. The state is focused on generating revenue internally through, taxes and fines in addition to other investment initiatives (Appendix 2c). The size (physical and monetary) and statutory nature of residential assets makes them relatively easy to monitor even for

⁶ Interview with Moses Umuetha of International Farwood Property Limited Nigeria conducted on January 23rd, 2013

inadequately equipped tax organizations. Additionally, the state government retains all revenue for taxes levied on property or related activities such as naming of streets⁷. The Lagos State government in recognition of these benefits streamlined all forms of taxes on property in favor of an all-inclusive property tax. Following the leadership of the Lagos state government, the Rivers and Edo state governments have also adopted the Land Use Charge but their tax systems are not as clearly defined as that of Lagos State.

In Lagos State, the primary property tax levied is the Land Use Charge based on the Land Use Charge Law enacted in 2001. The charge levied is a percentage of the assessed value of the property to be paid by the owner. Furthermore, the law stipulates that once the land use charge has been imposed on a property all other property taxes cease to apply (Olawande, Ayodele 2011). These other charges include the Assessment Law, Land Rate Law, Neighborhood Improvement Charge Law and Tenement Rate Law. The amount charged is based on the formula outlined below where M is the annual rate and $[(LA \times LV) + (BA \times BV \times PCR)]$ is the assessed value of the property (Appendix 2d)⁸.

Olawande and Ayodele (2011) critically evaluate the provisions of the property tax regulations, making observations about its fairness and transparency. Although the calculation is transparent, determination of components particularly rate payable (M) and property code rate (PCR) are at the discretion of officers. This provision makes the system vulnerable to corruption and creates uncertainty, as individuals cannot independently determine their property tax levies from year to year.

Furthermore, they conclude that the land use charge is essentially a tax on capital value. However, in Lagos State 76% of formal households are rented and not owned according to the 2006 census thus it would have been more appropriate to base taxes on rental value.

The penalties for delay in paying the levied tax are charged incrementally depending on the period of delay. The charge determined as a percentage of the original tax payable for the property. Olawande (2011), assesses the fairness of the penalties with respect to property offered for rent. Using evidence from an opinion survey, the paper concludes that considering the rate of rental default, the penalties are severe. Lagos State rental property law stipulates that landlords cannot charge rent in advance for over a period of one year. However, given the stringent levies for default and the difficulty in enforcing

⁷ Proceeds from the following levies and taxation are retained solely by the state: Naming of Street, Right of Occupancy, Development Levy, Business Premises Levy, Road Taxes, Gambling and lotteries levy (World Bank, 2007)

⁸ LUC: Annual Land Use Charge levied in Naira

M: Annual charge rate. This is a percentage of the assessed value of the property. This may vary depending on the primary use of the property i.e. commercial or residential. The rates are as follows:

LA: Land area (square meters)

LV: Average value of land in the neighborhood (naira per square meter)

BA: Total developed floor area on the plot (square metres), or the total floor area of apartment unit in the case where the apartment has a separate ownership title.

BV: Average value of medium quality buildings in the neighborhood (Naira per square metre)

PCR: Property code rate for the building. This adjusts for deviations from the medium quality and degree of completion.

this law relative to the land use charge penalties, this law is often disregarded with landlords charging rent in advance for an average of two years.

Table 1

Property Use	Charge rate
Owner-occupied residential property (With the exception of property owned by pensioners and family compounds)	0.5%
Property used for manufacturing purposes	0.5%
Property used for both commercial and residential purposes	0.65%
Commercial property	1.75%

(Supplement to the Lagos State of Nigeria Official Gazette Extraordinary No. 41, Vol. 34 of 13th December 2001 Part B)

4.3 Benefits of Formal Housing

The benefits of formal housing are parallel to the indirect costs of informal housing. Agents in the formal housing market can take full advantage of government provided goods the most important of which are the protection of property rights ensured by the legal and judicial system and the police. This protects ownership, transfer and exchange of property assets so the value of the assets can be exercised to their full capacity (Loayza 1997).

In planned areas, the ministry of Urban planning is responsible for allocating land by primary purpose; residential, commercial, circulation and infrastructure. Furthermore, the state is responsible for providing water and electricity and well as facilitating sewage disposal, solid waste management and maintaining drainage networks and roads. However, the state has failed to provide the stipulated services to private constituents necessitating private sector involvement in the provision of these services. A household survey conducted by the World Bank in 2005 reported that only 7% of households have water usable water available in the dwelling and only 16% have access to the sewer system. The figure below outlines other primary private sector contributions in meeting the infrastructural needs of the formal housing market. This portrays the inefficiency of the State at providing public goods that are a direct benefit of paying taxes and remaining in the formal market.

5. The Informal Housing Market

The informal economy arises when the formal economy is made unattractive by high entry costs to legality that are unjustified by the benefits gained from entering the formal sector. Excessive taxes and regulations contribute to the cost of legality discouraging agents from participating in the formal economy. Furthermore, informality increases when governments are unable to enforce compliance. When these governments are incapable of efficiently providing public services; including enforcement of legal requirements for the formal housing sector and the provision of public utilities, the imbalance of benefits (costs) of formality weighed against the costs (benefits) of informality leads to a large and growing informal sector.

5.1 Summary of Existing Literature

5.1.1. Informal Housing in Nigeria

The literature on informal housing in Nigeria is extensive. Scholars have made key contributions to the discussion since the formal introduction of the concept in Nigerian Policy discourse by the ILO in 1986. These works contribute to the dynamic profile of the informal housing sector in Nigeria. Rural-urban migration catalyzed the growth of the informal sector in Nigeria (Fapohunda et al, 1975). In addition, legal and administrative bottlenecks led to inefficient allocation of land and housing resources contributing to a growing informal housing sector (Ikejiofor, 2006; Egbu, Olomolaiye & Gameson, 2008). Furthermore, the presence of middle-income and high-income informal settlements confirms that informality in Nigeria is not unique to the urban poor (Owei& Ikpoki, 2006; Arimah & Adeagbo, 2000).

The size of the informal property sector is estimated to be about 90% of the total market for real estate assets (ILD). In order to analyze informal housing, the distinction between informal housing and informal land use must be made. Srinivas (2003) describes informal land use as the unauthorized occupation of vacant public or private land, illegal subdivision of rental of land and unauthorized development. The informal housing market includes residential property arising from informal land use but additionally includes unapproved expansion of residential property, unapproved changes of primary purpose of use, increase in approved density per plot or heights of buildings, illegal leasing and other such violations of land use and urban planning/ development regulations.

5.1.2 Characteristics of Informal Settlements in Lagos

In Lagos, informal housing can be categorized by the nature of entry and the degree of deviation from the formal procedures. Informal settlements or slums are large agglomerations of (often poorly developed) residential property on illegally occupied land exhibiting outright non-compliance of land and urban planning regulations. These settlements are often characterized by reliance on low cost and locally available construction materials, absence of standards and regulation, reliance on family labor and rudimentary construction techniques thus the urban poor often inhabit such settlements. Over 200 such settlements of varying sizes exist in Lagos (Gandy 2006). However, as noted previously, property owned or inhabited by the middle and high-income population may also be informal. Primarily, informality in these cases manifests as incomplete compliance instead of outright non-compliance.

The characteristics of informal settlements are summarized based on interviews and in-depth analyses of “blighted urban areas” conducted by Agbola and Agunbiade (2009). Informal settlements in Lagos are densely populated with an average population density of about 700 inhabitants per hectare. The majority of the population are in the low income bracket with an average monthly household income of N15,000 (133USD, 2009 value). The primary occupation of inhabitants is fishing or trading.

Prevailing landholding patterns and means of land procurement in the informal market are diverse but in general they reflect continued adherence to customary law. Although

the procurement and occupation of land in informal settlements is considered illegal according to the current land tenure system, in several cases a substantial portion of the occupied land was originally purchased from landowners; often families, under traditional law⁹. Family or individuals landholders assert rights of exclusive possession by freely transferring land holdings (Aribigbola 2007; Nwaka 2005). In particular, landholders who did not formalize their landholdings and are therefore not subject to the land ceilings, offer their land for sale or lease in light of rising land prices due to increasing demand for urban land. Leasehold, where annual rent is paid to land owners (often families) is also a common means of acquiring land. Self-Acquisition, where occupants establish themselves on the land without prior consent of the landowners occurs most commonly occurs with government property.

Two forms of land transfers prevail in informal settlements; transfer within family and transfer within community. Some of the occupants interviewed claimed to have acquired the property from family members that were the previous occupants. In cases whereby a community (or major ethnic group) has a collective leasehold agreement, property is subleased to members of their community or ethnic group. The latter is a feature of the traditional land tenure system where transfers of land to strangers were prohibited (Yakubu 1985, Olajide 2010). These forms of transfers reflect the importance of reputation and relationships as a means of insuring transactions in informal markets.

According to the interviews conducted, agents remain informal for two primary reasons; inadequate public infrastructure and laborious and expensive land administration processes. Specifically, Agbola and Agunbiade (2009) conclude that in light of the quality of the surrounding community, residents in the surveyed areas did not see the importance of obtaining legal titles. Essentially, the perceived costs of entering the formal housing market outweigh the potential benefits that are provided by the government.

5.2 Costs of Informal Housing

The costs of informal housing can either be direct or indirect. Direct costs of informal housing include levies paid to remain in the property, bribes paid to government officials and the risk of loss of property and assets. The primary indirect cost of informality is the inability to take full advantage of public services including the judicial system, the police and public infrastructure such as electricity, water, sewage and refusal disposal amongst others.

The risk of loss of property and assets are not uniform for all informal properties. As prices in formal neighborhood increase, enforcement and in some cases regulatory requirements in these areas are made stricter therefore the risk of loss of assets increases. In some cases, proximity to developed areas with rising prices leads to ratification of the property but in other cases this leads to destruction or relocation of settlers. In the case where private agents (families or otherwise) own the land, as the price of the land

⁹ In Makoko the family owner was the Olaiya family, the Ojora family owned the areas now known as Ijora, Badia and Amukoko, the Oloto family were the previous owners of Iwaya and Okobaba. (Agbola, Agunbiade, 2009)

increases owners can benefit from making the property available in the formal market instead of maintaining leasehold agreements with settlers¹⁰.

On the other hand, as informality increases in an area it becomes more difficult and expensive to address. Options available include destroying the settlements, relocating the inhabitants or upgrading the settlements. All of these options become more expensive from a social, political and financial point of view as the population of the settlement increases. Morka (2007) observes that slum clearing initiatives have proven ineffective as they fuel the growth of new slums or lead to the expansion of existing ones with more complex dimensions. In many cases, the government faces resistance from inhabitants, human rights groups and beneficiaries of the informal system¹¹.

Public services in Lagos State are grossly inefficient thus diminishing the indirect costs of informality. Public services including the provision of public infrastructure and tenure security provided by the legal and enforcement systems are some of the benefits of formal housing. However in informal settlements, the community (or inhabitants) provides itself with supporting public utilities extra-legally or through the private sector. For example, inhabitants access usable water from the private sector and community refuse dumping sites (usually near the settlement) are allocated to meet refuse disposal needs (and reclaim marshy area).

The lack of urban planning regulation leads to haphazard development creating disorderly and unhealthy urban environments (Yapi-Diahou (1994), Nwaka 2005, Olajide 2010 among others). In particular, since there is no enforcement of urban planning laws (where they exist), owners develop up to 100% of their plot size, allocating less land for circulation. This has contributed to isolating these communities and limiting access to crucial services like health, education etc (Ali and Muhammad, 2006; Olajide 2010). In spite of the poor living conditions in many informal settlements, the informal sector meets the housing demand of the urban poor in particular, which both the private sector and the government have failed to do.

In addition, the system of enforcing property rights in the formal sector is blighted by various inefficiencies the most debilitating of which are corruption and lack of funding. The judicial system cannot act independently since the President or State Governors appoints judges in a non-transparent fashion (USAID 2010). Court personnel are often improperly trained and underpaid thus making them susceptible to bribes. Additionally, the court system takes an average of two years to resolve cases (and an additional four years to appeal). Of all Landlord/Tenant petitions submitted to the public defender in the period from 2008-2010 none were resolved¹². Even when cases have been resolved, inadequate enforcement makes it easy and lucrative to neglect court orders.

¹⁰ For example, Maroko was destroyed and replaced with high-income housing now called Oniru Estate.

¹¹ Clearance of Badia East; an informal settlement in Lagos in 2013 is currently being protested by Amnesty International, SERAC and UNHCR amongst others as a human rights violation

¹² 599 Landlord/Tenant petitions were received in the period 2008-2010 (Lagos State Ministry of Justice 2011).

Furthermore, as discussed previously, lack of education on the Land Use Act has meant continued adherence to customary law. Therefore, land held under customary law is considered secure against other claims from communities also recognizing customary law. Thus protecting transfers within and among informal communities. In combination, the inefficiency of the formal legal system and the protection provided by customary law, support individuals that choose to remain in the informal sector.

5.3 Benefits of Informal Housing in Lagos

The primary benefits of remaining in the informal sector are the formal costs averted. First, the landowner is not placed on tax rolls, which would require the landowner to pay a fraction of the value of the property every year subject to strict penalties as discussed previously. Second, owners can maintain more than the maximum legal land holding thus providing an incentive for large landowners to continue to trade real estate assets under customary law. Third, the financial and time costs of land administration processes including land registration, land transfer and building plan approvals are averted. Fourth, the limitations prescribed by urban planners on plot size, density per plot, maximum height etc. are not applicable allowing landowners to develop their land in the most profitable fashion.

In summary, while the regulatory environment is strict, expensive and laborious, the benefits of compliance are relatively inadequate. Government inefficiency in enacting and enforcing preemptive urban planning and development policy for all areas of the city, an inadequate legal system threatening tenure security and inadequate public infrastructure and utilities diminish the perceived benefits of formal housing in Lagos State. Costly regulatory requirements make it both lucrative (in some cases) to remain informal and expensive to transition into the formal housing market, particularly for the urban poor. Furthermore, private and public sector inability to meet the growing demand for low-income housing has resulted in a wide housing gap in the formal sector. Therefore, the informal housing sector has been an attractive alternative particularly for low-income earners. However, these factors also contribute to various forms of extra-legality in the middle-income and high-income property markets.

6. A Housing Model

The information on the dynamics of informal housing production in Lagos and in other parts of Nigeria can be organized in a simple model. The housing industry comprises of three sub markets. The first submarket is the formal market for the allocation of certificates of occupancy by the government. The second market is the informal market for the allocation of land or property with no certificate of occupancy. The third submarket is the market for the transfer of land rights documented by the certificate of occupancy. These transfers can occur formally or informally.

In this model, I follow closely Loayza (1997) therefore the model captures only the production of housing units i.e. the landlord and renter problem is not considered). Additionally the model does not explicitly consider the effect of regulation on informality. The model uses a housing production function but the basic construct and

equilibrium conditions do not change (See Appendix 4 for a detailed description of the model). The basic production function is given by

$$Q_i = Q(L_i, M) \left(\frac{G}{Y} \right)^\alpha, 0 < \alpha < 1 \quad (1)$$

where Y is the value of the total housing stock in the economy, L and M represent land and is a composite of all mobile non-land factors that go into the production of housing respectively. The price of M can be treated as a constant across all locations in a particular area while price of land depends on location. Assuming there are no moving costs, the equilibrium condition is;

$$[1 - \pi(\lambda, I)]\delta^\alpha = (1 - \tau) \quad (2)$$

We can thus estimate the size of the informal sector;

$$I = \frac{\delta^\alpha + \tau - 1}{\lambda \delta^\alpha} \quad (3)$$

$$\frac{\partial I}{\partial \lambda} < 0, \frac{\partial I}{\partial \tau} > 0, \frac{\partial I}{\partial \delta} > 0, \frac{\partial I}{\partial \alpha} < 0$$

7. Data Analysis

In this section, I aim to estimate the relative impact of the various determinants of the informal sector in Nigerian states using the MIMIC model. I estimate the impact of various determinants of the informal sector and determine the relative size of the informal sector using the resulting structural equations. Estimating the impact of determinants of the informal sector enables one to determine the impact of policies on the size of the informal sector.

7.1 Estimating the Impact of Determinants

Several direct and indirect methods of estimating the informal sector have been used to of shadow economies and the impact of determinants, with mixed success. Direct estimation methods include the use of surveys and tax audits and indirect estimation methods include electricity consumption analyses, currency demand analyses, satellite mapping and MIMIC/ DYMIMIC model. Due to data constraints, particularly with respect to housing and construction sector, I use the MIMIC model to estimate the impact of determinants of the informal sector.

The Multiple Indicators Multiple Causes (MIMIC) model involves estimating a latent variable for the informal sector using several indicators. The model also considers several causal variables and their effect on the informal sector. Although the MIMIC model has been used widely in the literature to estimate the size of the informal economy in cross country, regional and national analyses (Loayza 1997, Schneider 2005 amongst others¹³),

¹³ Loayza (1997) for Latin America countries, Giles (1995, 1999) for New Zealand, Giles and Tedds (2002) for Canada, Dell'Anno (2003) for Italy, Bajada and Schneider (2005) for Asia-Pacific countries, Schneider (2005) for 110 countries, Chaudhuri, Schneider and Chattopadhyay (2006) for India, Dell'Anno, Gomez and Alañón Pardo (2007) for France, Greece and Spain, Dell'Anno 2006 for Portugal, Vuletin 2008 for Latin America and the Caribbean (Anno 2006)

the adequacy of the model for this purpose has faced some criticism. Breusch (2005) argues that MIMIC models are an inadequate for estimating the size of the informal economy because they are subjective and pliable in practice. However, MIMIC models offer certain advantages over single indicator models. MIMIC models facilitate the use of more than one indicator to measure the informal sector and test determinants. Thus, the model captures various indications and determinants of informality.

Structural Equations Models estimate a structural and measurement equation. The equation that estimates the relationships between the latent variable and causal variables is the Structural equation while the measurement model is the equation that links the indicators with the latent variable.

In specifying the model I begin by considering the most general model with the data available and progressively omit variables with statistically insignificant parameters. I consider two indicator variables and four causal factors based on theory and observation. Data availability greatly limits the variables that can be considered for the model. Data used is obtained from three sources; the 2006 housing and population census, Doing Business estimates of measures of regulation and subnational income data from Canback (see Appendix 3). The data used is summarized in Table 1.

Indicators of Informal Housing

Impermanent Structures: This measure primarily captures low-income agents in the informal economy who primarily reside in slums or squatter settlements. This is consistent with the UN-Habitat definition of informal housing (in slums)¹⁴ that considers durability of housing unit to be an important indicator of formality. The structural impermanence also covers two important features of informality in Nigeria: First, this indicates non-compliance with urban planning regulations, which require evidence of structural stability. Second, this captures the reluctance to invest in informal housing due to the risk of losing assets. Non-durability in this case refers to units with walls constructed from bamboo, mud, metal or stone.

¹⁴ UN-HABITAT defines an informal household (slum) as a group of individuals living under the same roof in an urban area who lack one or more of the following conditions:

1. Durable Housing: A house is considered 'durable' if it is built on a non-hazardous location and has a structure permanent and adequate enough to protect its inhabitants from the extremes of climate conditions such as rain, heat, cold and humidity.
2. Sufficient living area: A house is considered to provide a sufficient living area for the household members if not more than two people share the same room.
3. Access to sanitation: A household is considered to have adequate access to sanitation, if an excreta disposal system, either in the form of a private toilet or a public toilet shared with a reasonable number of people, is available to household members.
4. Access to safe water: A household is considered to have access to improved water supply if it has sufficient amount of water for family use, at an affordable price, available to household members without being subject to extreme effort, especially to women and children.
5. Secure tenure: Secure tenure is the right of all individuals and groups to effective protection by the State against forced eviction. People have secure tenure when: There is evidence of documentation that can be used as proof of secure tenure status, and / or, there is either de facto or perceived protection from forced evictions.

Table 2

Sector	Main Material Used for the Wall
Formal	Cement/Blocks/Bricks
Informal	Stone Mud/ Reed Wood/Bamboo Metal/ Zinc Sheet Other

2006 National Census Classifications

Home Ownership: Although, the relationship between homeownership and informality is not explicitly discussed in this paper, the literature on informality in developing countries supports the link. Karachi () argues that informality provides better prospects for home ownership for low and middle-income households in Egypt. Furthermore, agents in the informal housing market construct their own housing and are not subject to the stringent regulatory requirements in the formal market. Thus, homeownership is more attainable. Finally, from an investment standpoint, Kapoor and Le Blanc (2008) conclude that the return on investment for rental housing in the informal market is higher than in the formal market thus encouraging investors to provide housing in this sector. On the other hand, this indicator could also potentially be caused by other factors in the model (availability of public services and regulation), which could distort the model.

Determinants of Informal Housing

Availability of Public Infrastructure: This refers to the parameter δ in the model. The two forms of this index are measured using the average (PSI2) and the average of the standardized values of the percentage of households with access to electricity (PSI1) and clean water. Access to solid waste disposal facilities was considered in previous models but it was insignificant both in the composite index (made the variable insignificant) and as a standalone variable. The availability of public infrastructure decreases the cost of informality i.e. inaccess to public services makes informality unattractive.

Regulation Index: An average of the standardized values of four indicators of the regulatory burden are used to measure the regulatory burden. These indicators are; Time in days to obtain construction permit, construction permit cost as % of income per capita, time in days to register property and cost of registering property as % of property value. This captures both the time cost and financial cost of the regulatory framework.

Land Use Charge: Tax burden is widely recognized as a determinant of informality. However, in Nigeria, taxes on property and land are not levied at the national level (if at all) this the tax system differs among states. Currently the Land Use Charge is levied in three states; Lagos, Rivers and Edo State, in order of implementation and only the first two were implemented at before the period considered in the data. For this reason, Land Use Charge is included in the model as a dummy variable where 0 means no Land Use Charge and 1 means the land use charge is in effect.

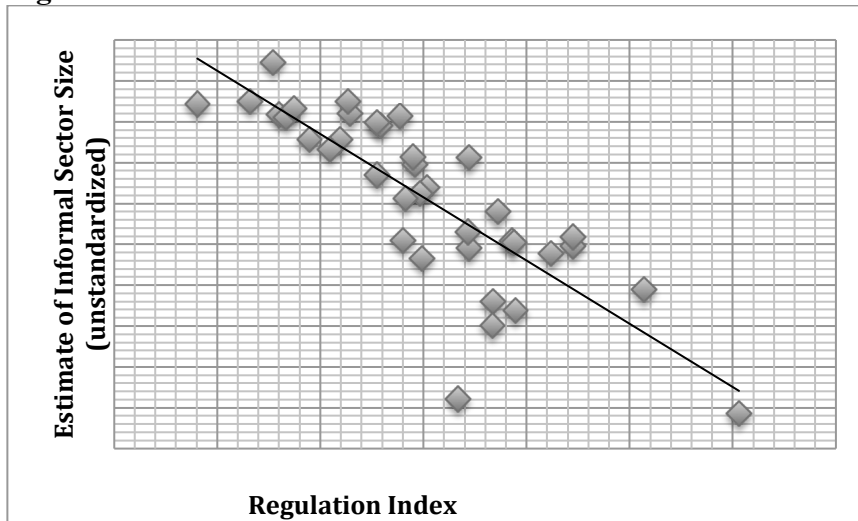
Income per capita: Income per region, in the Nigerian context, affects three factors positively, namely; ability to cover cost of regulation, quality of public services and the demand for land. De Souza (2009) provides evidence to support the negative effect of rising housing prices on the size of informal settlements in the area.

7.2 Results of the MIMIC model

The standardized maximum likelihood estimates of the best three models are presented in Table 2. Standardized coefficients show the effect of standard deviation changes in the causal variables on the response variables. The use of standardized estimates has some limitations the most pertinent of which is that it standardized estimates infer the relative importance of variables in a model in terms of their effect on the response variables. However, it is appropriate in this case for interpretation purposes since the variables have different measurement units. MIMIC 1 includes all variables in the analysis and modifications are made in the other two models. In MIMIC 2, I omit the variable that measures tax burden and in MIMIC 3 I modify the public services index to be a percentage of the two inputs and I include covariances. The path diagrams corresponding to each model and standardized estimates are presented in Appendix 5.

The coefficients in all models have the expected signs except regulation. The coefficient on regulation is negative and significant which is consistent with the correlation of the variables (Appendix 5, Table 5). Although this is contradictory to the literature, this makes sense at the local level for several reasons. First, regulatory requirements are a source of income for government parastatals therefore; enforcement increases in areas where revenue from policing is higher. The positive correlation between regulation and income supports this hypothesis.

Secondly, the variables used in the model are better indicators of informal housing occupied by low-income households. These informal agglomerations are characterized by improper sanitation, lack of urban planning and disorderliness. Therefore, if regulation is higher in higher income areas, informality is likely to relocate to less regulated areas. Therefore, an increase in regulation and enforcement pushes the informal sector to areas with less regulation. Figure 1 reports the relationship between the size of informal settlements and regulation.

Figure 1

All causal variables are significant in each model except the measure of tax burden. This could be due to the loss of information by creating dummy variables. I consider MIMIC 1 to be the best model in terms of comparative goodness of fit.

Table 3: Standardized Results of MIMIC Model

MIMIC Models	Public Services Indicator (β_1)	Regulation Indicator (β_2)	Presence of Property Taxes (β_3)	Income per Capita (β_4)
MIMIC 1	0.53* (0.099)	-0.37* (0.11)	0.13 (0.094)	-0.29* (0.086)
MIMIC 2	0.51* (0.10)	-0.30* (0.11)	-	-0.30 (0.088)
MIMIC 3	0.59* (0.094)	-0.24* (0.099)	-	-0.28* (0.081)

Notes: 1) Significant coefficients are indicated and standard errors are given in parentheses. 2) Presence of property taxes is not significant at the 5/10% levels 3) The sample size is 37

Goodness of fit (GOF) Statistics

Global GOF Statistics	Chi-square (p-value)	RMSEA (p-value)	CFI	AIC
MIMIC 1	5.37 (0.15)	0.15 (0.18)	0.977	1156.40
MIMIC 2	4.10 (0.13)	0.17 (0.15)	0.980	1177.86
MIMIC 3	4.31 (0.12)	0.17 (0.14)	0.979	1355.04

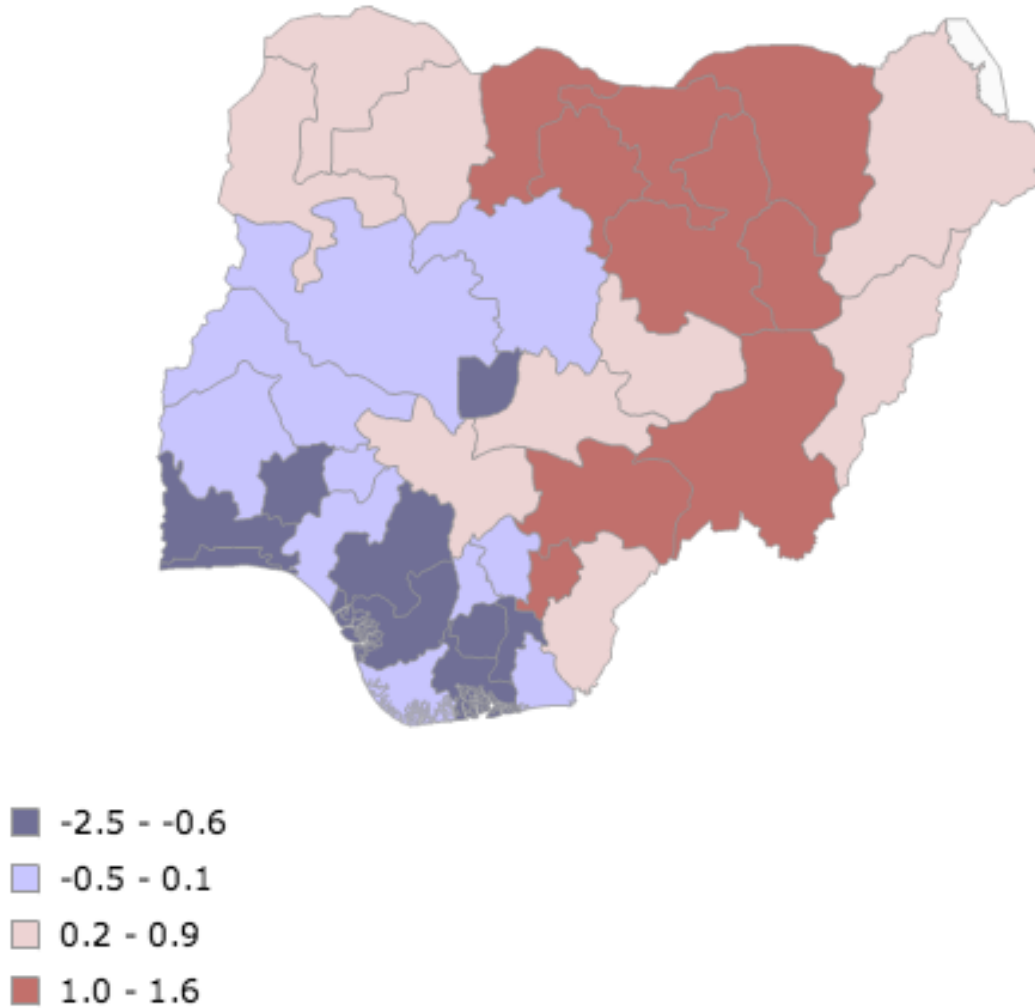
Notes: 1) Chi-square indicates “badness-of-fit” so mean is good fitting if p-value>0.05. 2) The discrepancy in the goodness-of-fit indicated by the RMSEA and the CFI statistics can be attributed to the small sample size and degrees of freedom in the model (RMSEA has upward bias for small sample sizes)

7.3 Estimating the Relative Size of Informal Housing

Using the unstandardized estimated equation (4); I determine the size of the informal sector in these areas. The results of this model should be used with caution given that only a few features of informality are considered. Notably this model considers informal/squatter settlements, non-compliance with building plan regulations and does not include a measure of enforcement (although income differences may explain some variation in enforcement). It is likely that the extra legality in the housing sector may be more rampant than the model predicts. The results are reported in Table 6 (Appendix 5). Informal settlements are fewer in the two largest cities; Lagos and Abuja and most prevalent in Northern States including Taraba, Jigawa and Yobe.

$$Q_{index} = 12.34\beta_1 - 14.84\beta_2 + 12.6\beta_3 - 0.041\beta_4 + 50.02 \quad (4)$$

Figure 2: Nigerian States by Size of Households in Informal Settlements (Standardized¹⁵)



¹⁵ I calculate the estimates using equation 4 and present the z-score of the estimates.

8. Conclusion

Governments are able to address both demand and supply side constraints adopting enabling policy. Policy responses to the shortage of housing in Nigeria have involved direct public intervention in the production of housing, introduction of new laws to control urban sprawl. In particular, at the state level, governments focus on direct construction however, literature suggests that the public sector is not as efficient as the private sector in meeting the housing demands of the population. Moreover, regulation of urban sprawl (another popular policy strategy) approaches the informal housing clusters as an urban blight that must be sequestered or eliminated.

The model provides evidence of some supply side instruments that could encourage participation in the formal housing market. The empirical analysis confirms the theoretical hypothesis that where agents are mobile, an imbalance in regulation and enforcement across regions contributes significantly to the size of informal/ squatter settlements in regions where informality is rampant. A broader profile of informal housing can be evaluated with access to more accurate indicators of non-compliance that can capture partial informality, which is a dominant form of extra legality in Lagos (for instance compliance with property levies, tenure status of occupants).

Given the arguments presented and the empirical evidence provided, several recommendations can be made. Firstly, areas of high informality are generally underserved thus by increasing the availability of public utilities, urban planning services and infrastructure in areas of high informality, this creates incentives to join the formal market. Secondly, regulation and policing to reduce informality in certain areas doesn't address the root cause of informality thus governments have several options. Governments can ensure uniform policing and regulation across regions to ensure that informal settlements don't simply relocate and eventually aggregate forming stronger communities. However, this does not address the supply side constraints that make the formal sector unattractive. Therefore, governments can aim to balance the costs and benefits of regulation either by increasing the availability of infrastructure or by streamlining regulation costs and eliminating processes that hinder efficient land delivery and housing supply.

Further, analysis of the informality at the state and local government level can help guide policy. In Nigeria, policy concerning housing is generally implemented at the state level therefore analyses that can explain informality in this context may prove more useful. As data become available, a multifaceted profile of informality based on existing models can be developed to guide policy decisions at the state and national level. Literature currently provides tools to estimate the risk of informality and to determine the interaction between formal housing prices and informality. Data on the rental value of housing units in the formal and informal sector can be used to determine the relative risk of informality (Kapoor, Le Blan, 2008). As in Souza (2009), data on housing prices and urban planning requirements can be used to determine the effect of formal housing prices on the size and spatial location of informal housing in each region.

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APPENDIX

Appendix 1: Public Sector Housing Initiatives

Plan Period		Responsibility	Impact
1925-1928	LEDB	Lagos State Executive Development Board was established to clear areas affected by the bubonic plague and provide alternative housing.	Slums on Lagos Island and near the lagoon were cleared.
1920-1960		Housing in Government Reserved Areas were provided for civil servants by the colonial government	
1955	LSCS	The Lagos Slum Clearance Scheme came into effect	
1955		The Surulere Housing scheme came into effect to provide temporary housing for those displaced by slum clearing activities	Many displaced families were unable to repossess land so the inhabited the Surulere housing provided permanent housing for such families. Low rental housing was also provided for workers in all income groups.
First National Development Plan			
1962-1968	LEDB	Provide Housing for workers in Lagos state.	Several Housing scheme s including the Illupeju Estate were completed.
Second National Development Plan			
1970-1974	FHA	Extend credit facilities to workers.	
1971	FHA	Address the housing needs of the country by overseeing all commissioners and other housing corporations	
1972	NBS	Federal Government bought over the shares of the Common Wealth Development Corporation in the Nigerian building Society	
Third National Development Plan			
1974	FMB	Nigerian building	

		Society becomes the Federal Mortgage Bank responsible for lending to institutional housing developers in the private and public sector	
	FHA	15,000 housing units proposed in Lagos State	Only 8,500 completed in Lagos State
		All employers with 500 or more employees were directed to provide housing estates for their staff. Incentives such as free serviced plots and financial subsidies of up to a third of the cost were provided	Large organizations including Central Bank, First Bank, National Bank, NNPC, Agip, Chevron and Mobil complied with the directive by building residential estates for different categories of employees but non-compliance is common since no penalties were stipulated or applied.
1976	LSDPC	LSDPC commences plans to create satellite towns around Lagos to reduce pressure on the central city.	Satellite town and FESTAC were a result of this project.
1978	FGN	Land Use Act was promulgated to improve the ease of access to Land	Mixed success due to bureaucratic inefficiencies, strict regulatory climate and lack of enforcement
1979-1983	FHA	Under the Federal civilian government the construction of 8,000 housing units was proposed primarily for low-income earners in Lagos. 160,000 were proposed at the national level	The target was not met (only 32,227 housing units were constructed). The failure was due to the poor and hasty implementation that made it difficult to supervise projects. Additionally, basic public services were unavailable in many of the constructed units so many of the homes were left unoccupied
1979-1983	LSDPC	Under the civilian government of Lateef Jakande in Lagos the provision of 50,000 housing units was proposed	Almost half of the target of 50,000 units was met (23,110) making it the most successful housing scheme to have been executed. Units were offered for sale at a subsidized rate, cheaper than Federal housing to low-income earners. However,

			housing quality was low as a result providing only the bare minimum so that owners will invest in its development at as their finances allowed.
	LSDPC	Plans for new housing estates for low and middle income groups were made	This led to the development of Ogba, Amuwo Odofin, Epe, Ikorodu and Badagry, which have all been incorporated into metropolitan Lagos.
1982	LBIC	The Lagos Building Investment Corporation was created to divest LSDC of its investment and Mortgage divisions, in order to promote house ownership and rented housing in Lagos.	The LBIC provided finance for the public interested in purchasing low cost housing provided by LSDPC.
Fourth National Development Plan			
1981-1985		During this period, the federal government proposed construction of 440,000 dwelling units annually. 115,000 of these are earmarked for the low- and middle-income groups.	The target was not met.

Summary compiled from: Osuide (1988), Abiodun 1976, Awotona 1987, Aluko 2012

Appendix 2: Regulatory Climate**Appendix 2a: Registering Land Application Requirements and Channels**

Requirements for Processing Non-State Land Certificate of Occupancy	
1.	Formal Letter addressed to the Executive Secretary – Land Use and Allocation Committee, Block 13, Room 4, Lands Bureau, The Secretariat, Alausa, Ikeja.
2.	Completed Certificate of Occupancy Form with receipt.
3.	Land Information Certificate with receipt.
4.	Four original Survey Plan (2 cloth and 2 paper).
5.	Four Passport Photograph with white background.
6.	Sketch Map of the Site Location
7.	Purchase Receipt Duly Stamped.
8.	Evidence of payment of Income Tax
9.	Current Development Levy. (In case of Company, Two Directors Tax Clearance and Development Levy).
10.	Publication Fee – N10,000.00
11.	Capital Contribution Fee subject to a minimum of N30,000.00
12.	Building Plan Approval if developed.
13.	Copy of Tenement Rate Receipt (if occupied).

Lagos State Lands Bureau

Application Process and Costs			
No	Procedure	Time to Complete	Associated Costs
1	Conduct a property title search at Lands Registry	1 day	NGN 590,686 NGN 3,750 (search at Registry) + Legal fees as follows: NGN 7,500–10,000 + 7.5% of values above NGN 20,000 if acting for the buyer (5% of values above NGN 20,000 if acting for the seller)
2	Obtain application Land Form 1C from Lands Registry	1 day	No cost
3	Obtain Certified True Copy (CTC) of title document from Lands Registry	2 days	NGN 5,625
4	Obtain a survey plan from Town Planning Authority	1 day	No cost
5	Execute deed of assignment and Land Form 1C	1 day	No cost
6	Pay charting fee, administrative fees,	1 day	NGN 12,000 Charting Fees (NGN 7500) + Administrative fees (NGN 3000) and

	endorsement fee at a designated bank		Endorsement Fees (NGN 1500) Capital gains tax of 2% is also paid, but are not included in the calculation
7	Submit application for Governor's consent to the assignment to Directorate of Land Services	1 day	No cost
8	Obtain notice of stamp duty, registration fees, consent fees, neighborhood improvement charge from Land Registry	7 days	No cost
9	Pay stamp duty, registration fees, consent fees, neighborhood improvement charge at a designated bank	1 day	NGN 1,005,118 8% Consent Fee + 3% of the property value registration fee + 2% of the property value stamp duty (Capital gains tax of 2% is also paid, but are not included in the calculation).
10	Submit receipts of payment of registration fees, consent fees, neighborhood improvement charge, stamp duty to Lands Registry	61 days	No cost
11	Obtain file from Land Services Department	1 day	No cost
12	Stamping of deed of assignment at Stamp Duty Office	1 day	No cost
13	Registration of deed at Lands Registry	3 days	No cost
	Total	82 days	

Doing Business

Appendix 2b: Building Plan Approval Requirements and Channels

Requirements for the Processing of Building Plan for Approval	
1	Proof of Ownership
2	Copy of Sun Print Survey Plan (beacon sheet for Government Estate)
3	5 sets of Architectural Drawings submitted in A3 format (along with a diskette)
4	5 Sets of Structural Drawings with
5	Calculation Sheets
6	Letter of Supervision from a Registered Engineer (COREN)
7	Current Income Tax Clearance Certificate
8	Current Special Development Levy Receipt
9	Tenement rate/ Sworn Affidavit in lieu
10	Clearance letter from the relevant government Agencies including but not limited to LUAC, Drainage, Urban Renewal Board, NEPA, Fire Service, Sewage etc
11	2 Copies of technical report (where applicable), prepared by a registered Town Planner.
12	Outlines the social and economic impact of the development especially applicable for high-rise developments.
13	Clearance Letter for Charge of Use (where Applicable)

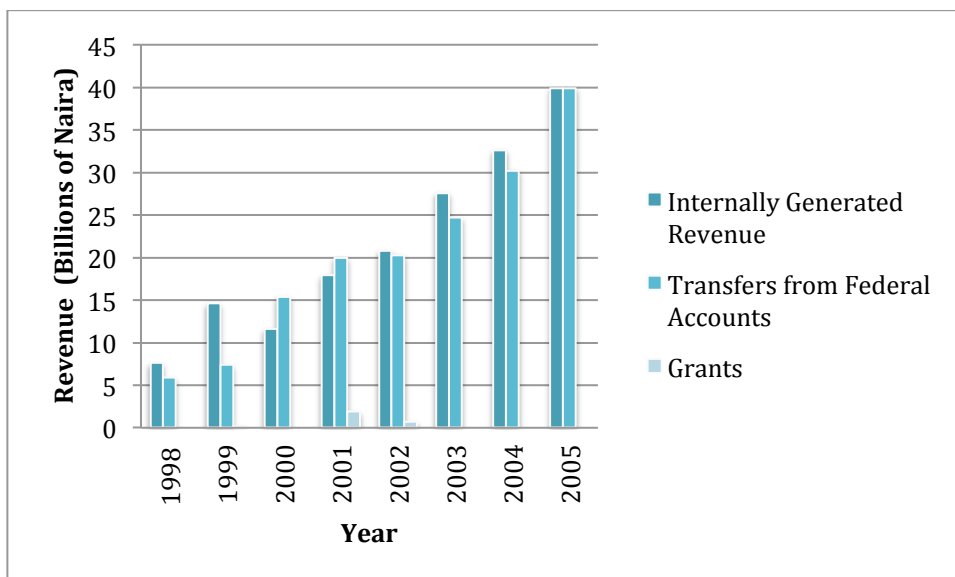
Application Submission and Registration			
1	Initial Review	Actor	1-2 Days
	Submit Title Documents and Architectural Documents for immediate Review	Applicant	
	Vet Architectural Drawings to assure structural standards		
	NB: Only applications that meet requirements are accepted for processing. Applications for developments in unplanned areas such as excised villages are not accepted.		
2	Processing Fee	Applicant	
	Collect Teller from Urban Planning Office in Alausa		<1 day
	Pay standard processing fees at a local bank and obtain confirmation		<1 day
	Processing Fees		
	State Govt: of N64 per square meter of the proposed development for Eti-Osa and Ikoyi LGAs		
	Local Planning Office: 10% of State government fee		
	LASPPDA: determined based on the metric		
	After 2 weeks of paying, clear payment in LASPPDA office and collect receipt		2weeks
	Submit Receipt to Local Planning Office		1 day
3	Site Visit		
	Visit site with a Local Planning Authority officer.		1-2weeks
	Length of time depends on availability and staffing of		

4	the local office Application Registration Submit application with all requirements met to the Local Planning Office	1-2 days
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Application Review Process		
1	Registration District Officer instructs Admin officer to register the application.	
2	Inspection Site visit and inspection with field officer Charting Officer approval of layout of the development or estate Engineer review of structure and stability	
3	District Office Review Vetting/ Recommendation Officer reviews application and submits a vetting form to recommending officer Recommending Officer signs the documents and sends them to the district officer	
4	Final Ministry of Urban Planning Approval 2 floors: General Manager Approval 2-4 floors: Physical Planning Permanent secretary approval 5-6 floors: Physical Planning Committee 6 floors: Governor	
5	Tax Clearance Following Ministry of Urban Planning approval, the application is forwarded to state tax office (LIRS). Property tax rates are ascertained here Report fees to Ministry and forward to district office upon approval	
6	Stamp and Seal Application is returned to the district office where applications are stamped and sealed District officer signs application and issues a development permit.	

Eti-Osa Planning Office

Appendix 2c: Lagos State Revenue Stream



Source: Lagos State Finances Review, World Bank (2007)

Appendix 2d: Land Use Charge

$$LUC = M \times [(LA \times LV) + (BA \times BV \times PCR)]$$

LUC: Annual Land Use Charge levied in Naira

M: Annual charge rate. This is a percentage of the assessed value of the property. This may vary depending on the primary use of the property i.e. commercial or residential.

The rates are as follows:

LA: Land area (square meters)

LV: Average value of land in the neighborhood (naira per square meter)

BA: Total developed floor area on the plot (square metres), or the total floor area of apartment unit in the case where the apartment has a separate ownership title.

BV: Average value of medium quality buildings in the neighborhood (Naira per square metre)

PCR: Property code rate for the building. This adjusts for deviations from the medium quality and degree of completion.

Penalties

Delay	Charge
45-75 days	25%
76-105 days	50%
106-135 days	100%
136 days and over	Property liable to receivership

(Section 20)

Appendix 3: Data sources

Source	Date	Data Description
National Census	2006	Data on household characteristics at the national and local government level compiled by the National Population Commission is published on their website. Data on percentage of owner occupied housing, structural characteristics of households and availability of public services including electricity, water supply and waste disposal facilities were obtained from the website. The data is the best available at the national level, however at the state and local level the Lagos State Government publishes a statistical Digest which is favored in the literature and government documents.
Doing Business	2012	Estimates of the cost of regulations including; registering property, obtaining construction permits and enforcing contracts at the state level were obtained from the Doing Business database.
Lagos State Statistical Digest	2011	This dataset includes data compiled from all the ministries. The percentage of registered households that pay the land use charge was compiled from this dataset.
Lagos State Household Survey Canback Global Income Distribution Database	2007	Data on PPP GDP per capita for each of the Nigerian States were obtained from this source.

Appendix 3: Model

In the economy, agents are endowed with different amounts of land. The quantity of housing produced by each agent depends on the price of land and the cost of other factors that go into the production of each unit. In order to keep the model simple we use a model of housing production that has been the basis of several theoretical models. The underlying assumptions of this production function are discussed extensively in Christensen, Jorgenson, and Lay (1973)¹⁶. The basic production function is given by

$$Q_i = Q(L_i, M) \left(\frac{G}{Y} \right)^\alpha, 0 < \alpha < 1$$

where Y is the value of the total housing stock in the economy, L and M represent land and is a composite of all mobile non-land factors that go into the production of housing respectively. The price of M can be treated as a constant across all locations in a particular area while price of land depends on location. Following the setup of Loayza (1997), G represents the flow of public services and α represents the elasticity of output with respect to $\left(\frac{G}{Y} \right)$. Thus, $\left(\frac{G}{Y} \right)^\alpha$ measures the productivity of public services relative to private services.

Informal agents can avoid the cost of taxes and regulation however; informal agents pay a portion of their income as penalties. A penalty in this case refers to bribes paid to government officials and other agents. Revenue from penalties is not used to pay for public services contained in G. Additionally, as a result of their extra-legality, informal agents don't have full access to public services. Assuming a Cobb Douglas production function, production in the informal sector is given by:

$$Q^I = (1 - \pi)L^\beta M^{1-\beta} \left(\frac{\delta G}{Y} \right)^\alpha, 0 < \pi < 1$$

where π is the effective penalty rate and δ is the fraction of public services available to informal agents. I is the relative size of the informal sector

$$I = \frac{Y^I}{Y}$$

The penalty rate is a positive function of the effective strength of the enforcement system and of public dissatisfaction with the informal sector. The strength of the enforcement system determines the ability to detect and penalize informal activities. Dissatisfaction with the informal housing sector can affect the penalty rate in two ways. First as housing prices increase in a specific location, the penalty rate for informality increases. We can thus think of the penalty rate as a measure of the risk of remaining in the informal sector, which increases as housing prices increase. This captures the fact that the risk and potential losses associated with informality are higher in areas with higher housing

¹⁶ The pertinent assumptions are as follows:

Assumption 1: The housing production function $Q(L, M)$

- i. exhibits constant returns to scale, implying that $Q(L, M) = L \cdot Q(1, M/L)$
- ii. is strictly increasing, strictly concave and twice differentiable.

The constant returns to scale assumption is supported by the observation that firms of varying sizes characterize the housing construction industry in Nigeria.

Assumption 2: Firms behave as price takers

That is to say no landowner is large enough to influence market price so land and housing prices are influenced by the desirability of the property and location.

prices. Secondly, as the size of the informal sector increases in an area, dissatisfaction also increases. This captures the tendency of informal housing to occur simultaneously in areas with a lack of adequate public services. The penalty rate is given by

$$\pi = \pi(\lambda, I)$$

$$\frac{\delta\pi}{\delta\lambda} > 0, \frac{\delta\pi}{\delta I} > 0$$

Loayza (1997) proposes a simple functional form of the above equation that also presents a positive interaction between enforcement and the size of the informal market. Thus,

$$\pi = \lambda I$$

The quantity of land available in the formal sector is determined not only by the cost of land and the cost of inputs but also by taxes, regulation and the public services provided. Property tax (τ) paid by agents on formal property is used to both finance the provision of public services and the enforcement system.

$$Q^F = (1 - \tau)L^\beta M^{1-\beta} \left(\frac{G}{Y}\right)^\alpha \quad 0 < \tau < 1$$

We assume that public services available to homeowners are exclusively financed by property taxes and some regulations and taxes imposed by government are unproductive and/or misused. Therefore,

$$G = \eta(q, \lambda)(\tau Y^F), \quad 0 < \eta(q, \lambda) < 1$$

where $\eta(q, \lambda)$ is the fraction of tax revenues available for the provision of public services and $1 - \eta(q, \lambda)$ is the fraction that is not wasted. Given that higher quality government institutions impose fewer wasteful regulations and administer fiscal resources efficiently, $\eta(q, \lambda)$ is assumed to be a positive function of the quality of government institutions (q). However, increasing enforcement effectiveness requires fiscal resources so $\eta(q, \lambda)$ is a negative function of enforcement strength(λ).

Assuming there are no moving costs, the equilibrium condition is;

$$[1 - \pi(\lambda, I)]\delta^\alpha = (1 - \tau)$$

We can thus estimate the size of the informal sector;

$$I = \frac{\delta^\alpha + \tau - 1}{\lambda \delta^\alpha}$$

$$\frac{\partial I}{\partial \lambda} < 0, \frac{\partial I}{\partial \tau} > 0, \frac{\partial I}{\partial \delta} > 0, \frac{\partial I}{\partial \alpha} < 0$$

Appendix 5: Data and Results

TABLES

Table 1: Summary Statistics

Variable	Mean	Std.Dev.	Min	Max
Public Services Indicator 1	-6.65E-09	0.95	-2.93	1.60
Public Services Indicator 2	78.00	10.79	44.38	95.83
Impermanent structures (% of total households)	53.57	24.06	7.68	89.53
Regulation Index	0.00	0.55	-1.10	1.53
Income per Capita	223.98	158.03	68.52	814.09
Home ownership (% of total households)	71.43	18.46	17.61	91.98

Note: The number of observations is 37 for each state in Nigeria

Table 4: Unstandardized Coefficients

MIMIC Models	Public Services Indicator	Regulation Indicator	Presence of Property Taxes	Income per Capita
MIMIC 1	12.34* (2.49)	-14.84* (4.84)	12.60 (9.17)	-.041* (.013)
MIMIC 2	11.73* (2.49)	-11.91* (4.41)	-	-0.042* (0.013)
MIMIC 3	1.20 * (0.21)	-9.52* 4.08	-	-.039* (0.012)

Table 5: Correlation Matrix

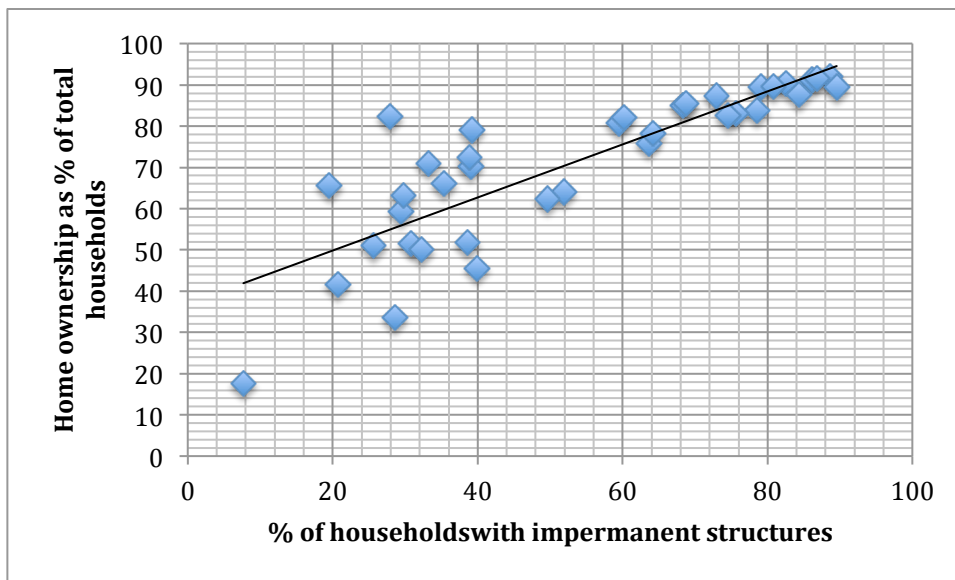
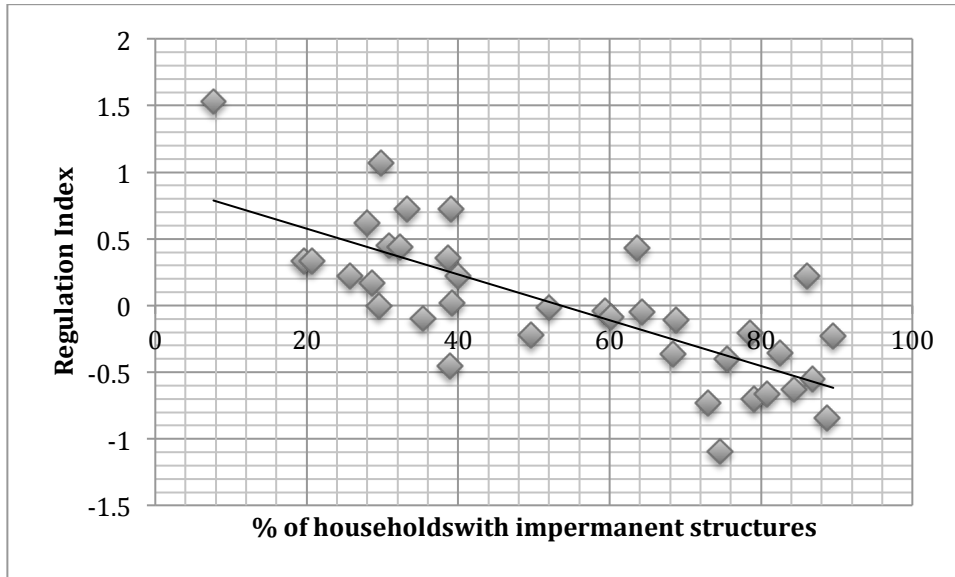
	Impermanent structures (% of total households)	Home ownership (% of total households)	Public Services Indicator	Regulation Indicator	Income per Capita
Impermanent structures (% of total households)	1.00				
Home ownership (% of total households)	0.84	1.00			
Public Services Indicator	0.74	0.82	1.00		
Regulation Index	-0.75	-0.67	-0.63	1.00	
Income per Capita	-0.65	-0.65	-0.51	0.48	1.00

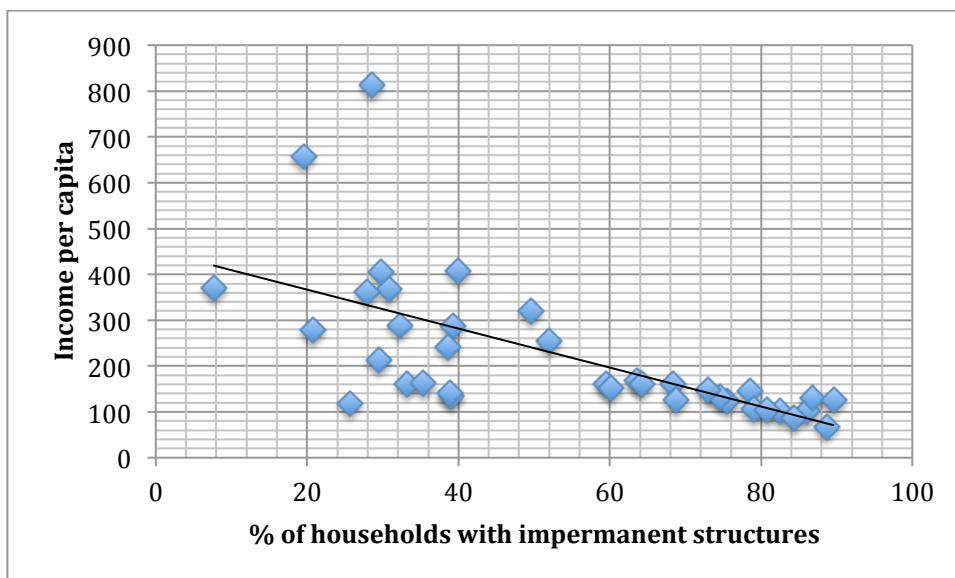
Table 6: Results of Estimation of Informal Sector

STATE	Size of Informality (unstandardized)
Abia	15.93
Adamawa	59.07
AkwaIbom	43.76
Anambra	29.57
Bauchi	61.94
Bayelsa	42.44
Benue	64.92
Borno	55.51
CrossRiver	47.01
Delta	29.04
Ebonyi	61.41
Edo	13.82
Ekiti	33.06
Enugu	31.72
FCTAbuja	-7.89
Gombe	61.83
Imo	27.76
Jigawa	65.06
Kaduna	30.83
Kano	64.43
Katsina	61.12
Kebbi	51.22
Kogi	53.28
Kwara	31.02
Lagos	-11.44
Nasarawa	49.52
Niger	41.23
Ogun	10.21
Ondo	38.11
Osun	26.55
Oyo	30.40
Plateau	51.32
Rivers	19.00
Sokoto	55.74
Taraba	74.56
Yobe	63.22
Zamfara	59.84

FIGURES

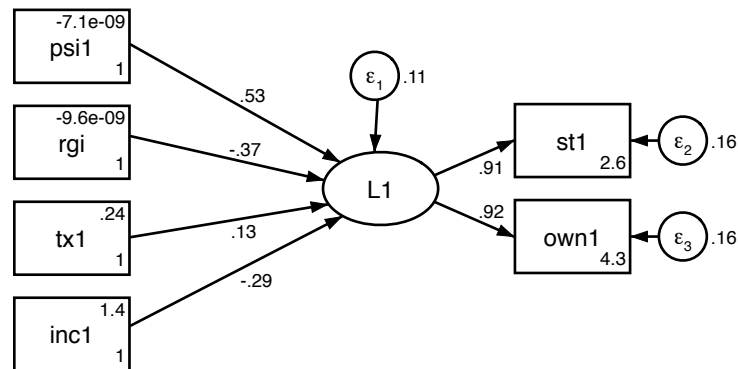
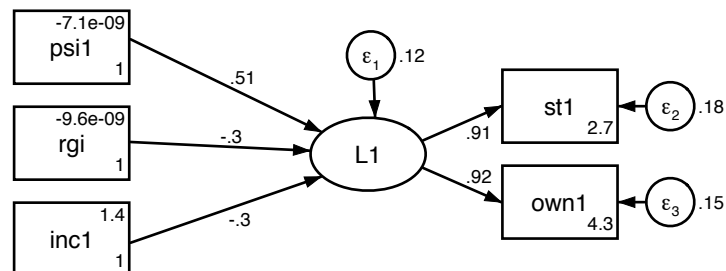
Scatter Plots





Path Diagrams

Variable	Description
STI1	% of households with impermanent wall structure.
OWN1	% of owner occupied housing
L1	Latent Variable for Informal Settlements
PSI1	Index of Public Infrastructure
RGI	Regulation Index
TX1	Dummy Variable for presence of Land Use Charge
INC1	Income per Capita

MIMIC 1**MIMIC 2**

MIMIC 3

