MicroBanking Bulletin

Exploratory Analysis of Local Geographies of Need and the Proximity of Microfinance Service Providers in Nigeria

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1. Background

The significance of microfinance in driving important aspects of the Nigerian Vision 20-2020 and other national policy programs like the Millennium Development Goals (MDGs) cannot be over-emphasized. The Vision 20-2020 seeks to position Nigeria in the league of world's top 20 economies by the year 2020. The alleviation of poverty remains pivotal if this dream is to be achieved. Microfinance is therefore considered a veritable tool for mitigating the problems of poverty particularly amongst the rural poor, for stimulating economic growth, supporting human development and empowering women.

Important changes in the activities of Nigerian microfinance service providers commenced around the middle of the first decade of the current millennium. Since the introduction of widespread reforms in the form of a policy framework for supporting and enhancing the provision of diversified microfinance services in Nigeria (CBN, 2005), the operations of microfinance service providers have grown phenomenally. The implementation of the reforms led to the transformation of community banks to microfinance banks. There are now more than 800 microfinance banks registered in the country, along with several NGOs and commercial banks that provide microfinance services.

In Nigeria, microfinance banks are expected to serve at least six statutory functions. These include:

- Providing diversified, affordable and dependable financial services to the active poor, in a timely and competitive manner, that would enable them to undertake and develop long-term, sustainable entrepreneurial activities;
- Mobilizing savings for intermediation;
- Creating employment opportunities and increasing the productivity of the active poor in the country, thereby increasing their individual household income and uplifting their standard of living;

- Enhancing organized, systematic and focused participation of the poor in the socio-economic development and resource allocation process;
- Providing veritable avenues for the administration of the micro credit programs of government and high net worth individuals on a non-recourse case basis; and
- Rendering payment services, such as salaries, gratuities, and pensions for various tiers of government.

The Central Bank of Nigeria (CBN) is charged with supervision and regulation of microfinance banks. Each of these goals can be matched to a seeming determination of the CBN to attain equity in service delivery.

In a revised microfinance policy, the CBN lists four targets for the sector:

- To increase access to financial services of the economically active poor by 10 per cent annually;
- To increase the share of microcredit as percentage of total credit to the economy from 0.9 per cent in 2005 to at least 20 per cent in 2020; and the share of microcredit as percentage of GDP from 0.2 per cent in 2005 to at least 5 per cent in 2020;
- To ensure the participation of all States and the FCT as well as at least two-thirds of all the Local Government Areas (LGAs) in microfinance activities by 2015; and
- To eliminate gender disparity by ensuring that women's access to financial services increase by 15 per cent annually, that is 5 per cent above the stipulated minimum of 10 per cent across the board.

At least two arguments which are relevant to this article can be advanced from the goals and targets listed above.

First, there is some measure of evidence of the importance of understanding local level dynamics in the requirements for microfinance support. Indeed, some of the targets directly measure this; for instance, the target to reach two-thirds of the LGAs with microfinance services. It has further been argued that there is considerable value in addressing developmental challenges from the roots. This requires intelligent analytics in understanding and drilling down to local levels of governance (Ojo et al., 2010; Ojo and Ezepue, 2011). This position also appears to be resonating within the corridors of central government. The following extract from the most recent Nigerian MDG report is a testimonial to the importance of undertaking local level analytics within the Nigerian financial services sector:

"Local governments are closer to the grassroots in providing basic services, so their actions or inactions impact directly upon the MDGs" (NPC and OSSAP-MDGs, 2010, p.8).

If the CBN and other important microfinance stakeholders are to see their dreams come to fruition, then adequate understanding of what is going on at the Local Government Area (LGA) administrative geography is imperative.

The second derivative from the list is the linkage between equity and access. An important question springs up in the readers mind when considering these two phenomena; to what extent will microfinance banks deliver on their mandates if "at-risk" populations, households and communities are limited in their ability to access the supposed services? Spatial proximity analysis is one of the conduits that can help stakeholders unravel the function of space and place in matters of equity and access to microfinance services.

To date, there is no evidence of previous investigations into the relationship between the distributions of microfinance banks and the socio-economic and demographic characteristics of the local populations they serve. Undertaking such analysis at the LGA scale can provide a useful layer of intelligence for stakeholders who are striving to reduce the burden of financial exclusion in Nigeria.

In the remainder of this article, the Nigerian LGA Geodemographic Classification System (NIGECS) is used to illustrate the extent to which spatial analysis and geodemographic modeling may be of benefit for expounding real issues affecting the citizenry at localized spatial scales. Such benefit can complement the efforts of local and international stakeholders within the Nigerian microfinance footprint, in their endeavors to address a variety of issues associated with financial equity, access, demand and supply.

2. Potential of the Nigerian Geodemographic System for Understanding Microfinance

Concisely, a geodemographic system is an area classification that simplifies a large and complex body of multivariate and multidimensional information about people, where and how they live, work and recreate. Geodemographic systems are developed based on geographical ontologies that similar people with similar characteristics are more likely to live within the same locality and that such locality-types will be distributed in different locations across geographical space.

The Nigerian LGA Geodemographic Classification System (NIGECS) encapsulates spatially referenced datasets for the year 2006 derived from the census and other national surveys sourced from the National Bureau of Statistics (NBS). Almost 35,000 data points spreading across 10 themes were used to create NIGECS following a rigorous selection exercise from a pool of nearly half a million data points. The ten broad themes that the data cover include:
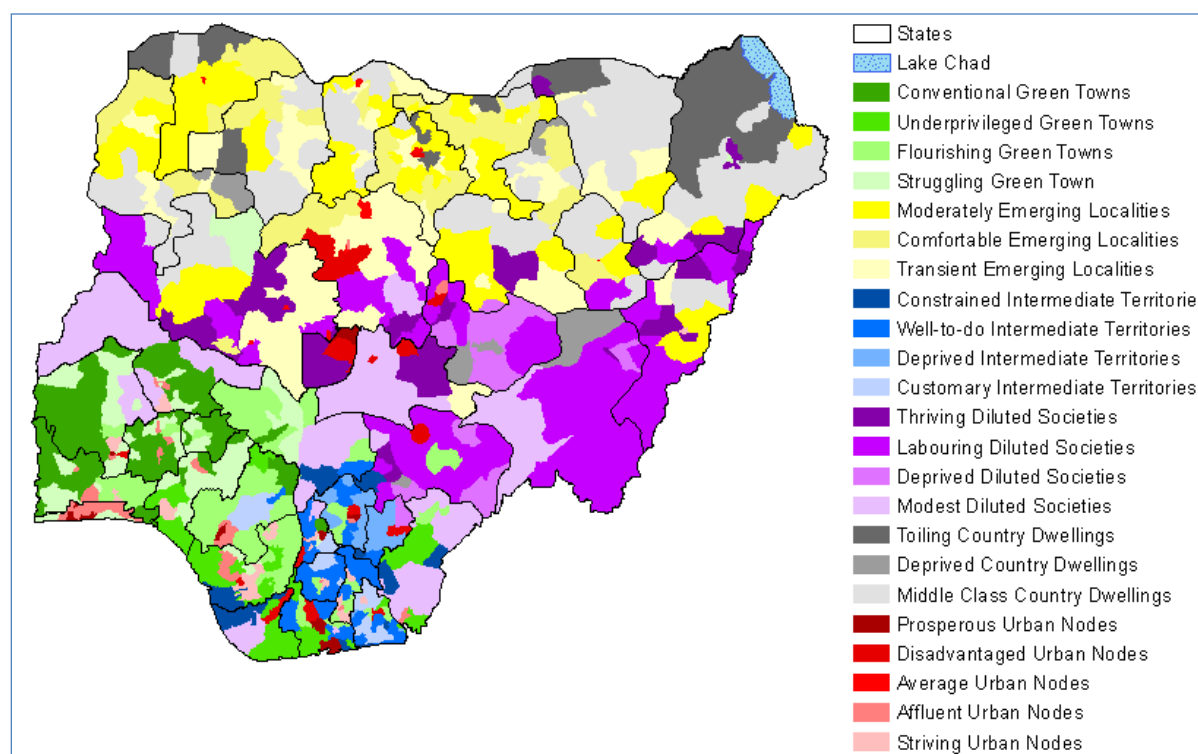
- Agriculture
- Demographic
- Education
- Employment
- Health
- Household Composition
- Household Infrastructure
- Housing
- Socio-economic
- Women and Children

Following rigorous analysis, all the 774 LGAs in Nigeria have been placed into one of 6 super-groups namely:

- Green Towns
- Emerging Localities
- Intermediate Territories
- Diluted Societies
- Country Dwellings
- Urban Nodes

Further analysis on the super-groups led to the creation of a second hierarchy of 23 groups and a third hierarchy of 57 sub-groups. This hierarchical structure of super-groups, groups and sub-groups allows for greater flexibility and means that analysis, visualization and reporting can be done at any of the three levels. Figure 1 is the map of Nigeria showing the spatial distribution of the 23 groups across the country's 774 LGAs.

By linking geodemographics, Geographic Information Systems (GIS) and spatial modeling with microfinance datasets, stakeholders including policy makers within the industry can benefit in multiple ways.

Some of the benefits that can be derived include:

- Enhancing population profiling and characterizing of areas
- Coding, linking and intelligent structuring of ancillary datasets
- Judicious targeting of resources
- Developing area-specific interventions
- Place-based comparative analysis
- Place-based budgeting
- Service user profiling
- Performance benchmarking
- Location-allocation modeling
- Data extrapolation
- Market area analysis
- Developing an evidence base of what works in which areas
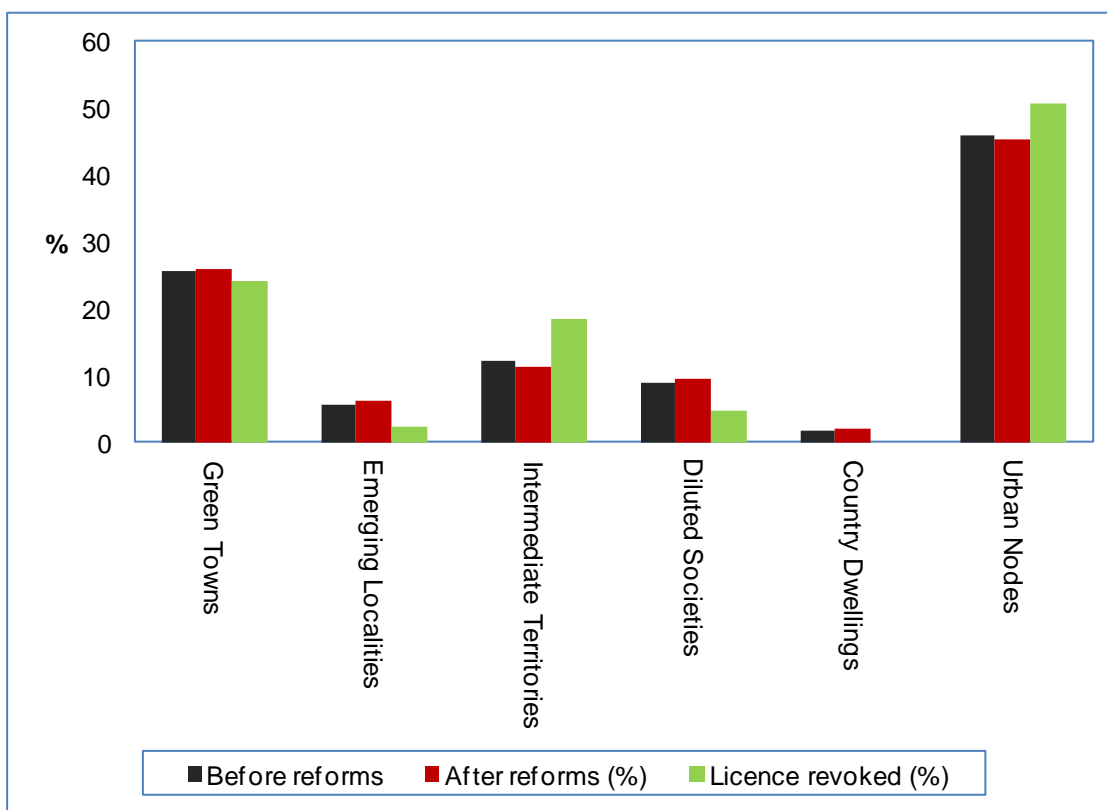- Social marketing

The geodemographic approach is anchored in the view that areas that are socially or economically disadvantaged differ in terms of their pathology of disadvantage. This leads to variations in the levels of their advantage or disadvantage. Reflecting on this proposition, one can conclude that since different forms of social and economic disadvantage derive from different chronological trajectories, therefore different area types will be well matched to quite different priority area programs and policies (Ojo et al., 2010; Ojo and Ezepue, 2011). For more details on the Nigerian system, comprehensive descriptions and detailed profiles of the typologies please see: www.nigerianlgaclassification.com.

3. Geodemographic Variations in the Distribution of Microfinance Banks

The term supply can mean different things in various disciplines. To avoid ambiguity, the term is defined here as the quantity of a product or service which is accessible to consumers. In this article, the presence or absence of microfinance banks in an LGA is used as a proxy for supply of microfinance services. We currently lack detailed information on the operations of microfinance banks. However, we hope that the development of monthly electronic reporting systems by the CBN and increasing transparency will allow this information to be available for analysis in the future. In the interim, we utilize what location information is available.

The location of each bank was linked to the geodemographic system via the LGA information traceable from the address of the bank.[1] The data was first analyzed by NIGECS super-groups. Results are shown in Figure 2. In addition, we track the current licensing status of banks, using lists of banks under provisional approval and those that had licenses revoked in 2010.

From the chart, we notice the disproportionate concentration of microfinance banks within Urban Nodes. Very briefly, those LGAs classified as Urban Nodes typically have a mean household size of about 4.6 people. They also have very high population densities in the region of more than 5,000 people per square kilometer. Urban Nodes are scattered across the country and do not necessarily concentrate in any geopolitical zone. However, the north east zone has the lowest share of this geodemographic typology.

Before the CBN reforms, 46% of all existing microfinance institutions were located in these types of LGAs. Following the reforms, Urban Nodes also suffered the largest loss in terms of share of institutions.

Approximately 51% of all banks that lost their licenses were operating within Urban Nodes. Even after this first "clean-up" exercise, these areas still have a 45% share of existing banks.

In terms of the spatial distribution of microfinance banks, the Country Dwellings are perhaps the most divergent from Urban Nodes. In brief, Country Dwellings spread across the north east and north west of Nigeria. They can also be found in the north central zone. The super-group has a mean household size of 5 people but a lower population density of 144 people per square kilometer.

The 11 institutions located within Country Dwellings before the reforms maintained their status as microfinance banks after the reorganization. This leaves Country Dwellings with its previous 2% share of all banks.

The discovery we make when license revocation rates are analyzed is also striking. Results of the analysis are shown in Table 1.

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[1] *The CBN posts lists of microfinance banks, with occasional updates, to the CBN website; see: www.cenbank.org/supervision/Inst-MF.asp. To date, the public lists have only had incomplete information on LGA locations though. The list accessed in May 2011, for instance, only had LGA data for 23 percent of the 800+ banks. Through manual inspection of individual addresses and re-classification, we were able to code LGA information for 80 percent of the banks. The remaining 20 percent lacked sufficient identifying location information to make a determination for the LGA. All banks in the list have state listed. While there are other providers of microfinance services, we restrict the subsequent analysis to the microfinance banks sector given the policy focus on this group and the breadth of reach across the country.*

Table 1:	Rates at Which Licenses Were Lost by NIGECS Super-groups

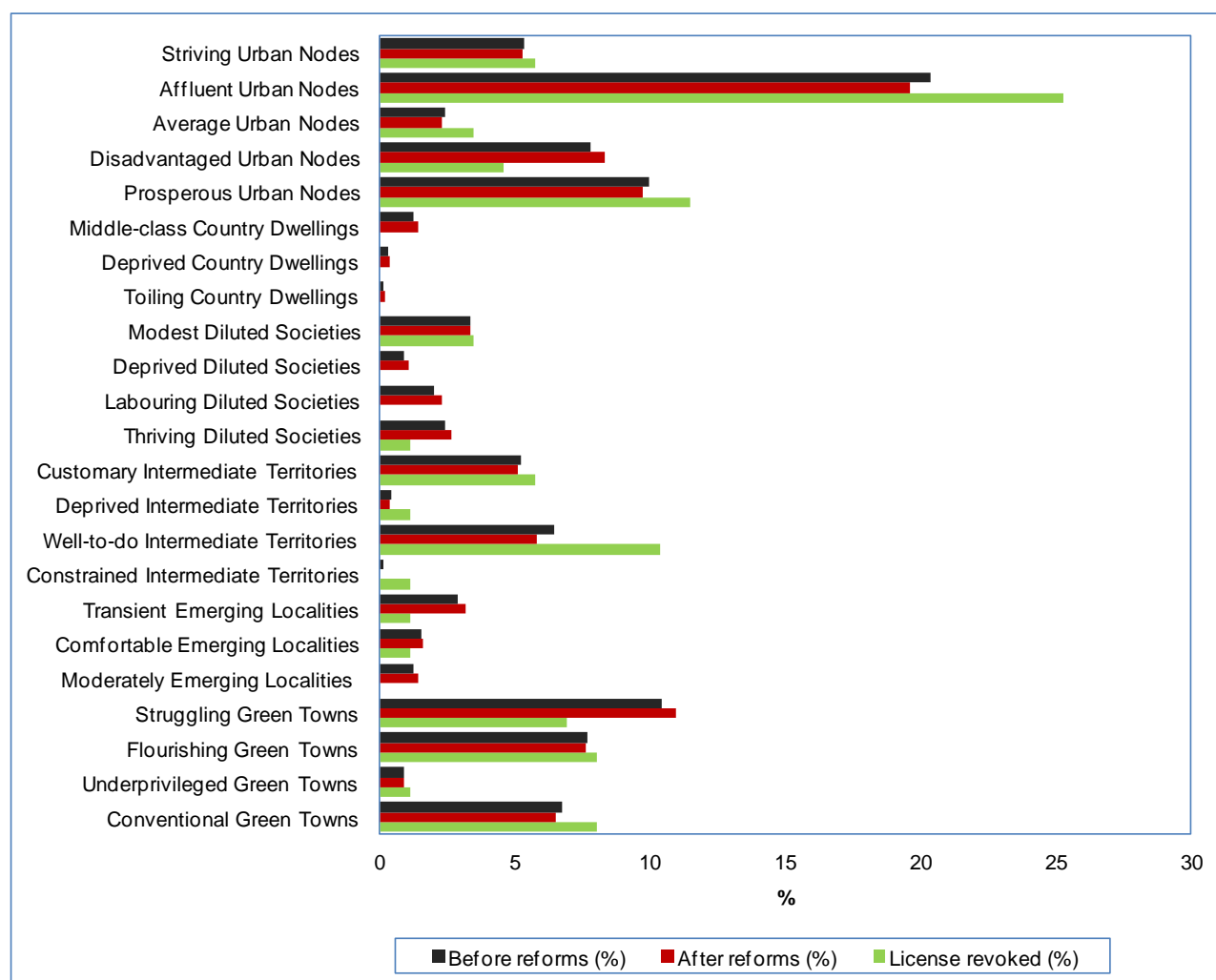| NIGECS Super-groups	License Revocation Rates (%)
Green Towns	13
Emerging Localities	5
Intermediate Territories	20
Diluted Societies	7
Country Dwellings	0
Urban Nodes	15

We find that the rates at which licenses were revoked is at a peak within Intermediate Territories. Briefly, Intermediate Territories are located mainly within the south east geopolitical zone. They are also scattered across the south zone and pockets of the north central zone. With a mean household size of 5 people, they have an above average population density of 709 people per square kilometer.

Results displayed in Table 1 show that for every 100 microfinance institutions in Intermediate Territories up to 20 lost their licenses. Therefore, while the percentage share of licenses lost in Urban Nodes was comparatively greater than other super-groups, the severity of license revocation was greatest for LGAs in Intermediate Territories. Later analysis will demonstrate some of the unique aspects of the Intermediate Territories.

To derive even greater insight, the data was disaggregated across the 23 NIGECS Groups. Figure 3 shows results derived from the analysis.

The distribution shown in the chart underscores the importance of this sort of analysis. There are marked differences suggesting some underlying or contextual factors. Within Urban Nodes, the comparatively advantaged LGAs have greater shares in the proportion of currently-licensed microfinance banks.

Figure 3:	Penetration of Microfinance Banks by NIGECS Groups

Before reforms (%)   After reforms (%)   License revoked (%)

An important observation in the course of the analysis is that the only institution located within Constrained Intermediate Territories before the reform had its license revoked. Further evaluation of the license revocation rates shown in Table 2 suggests a worrying trend particularly for the Intermediate Territories. The microfinance service provides located within Deprived Intermediate Territories had their licenses revoked at a rate of 33%. If we exempt Constrained Intermediate Territories (where the only existing institution lost its license), we discover that revocation rates across the country was most severe within Deprived Intermediate Territories. Only 2% of all microfinance banks in the country are currently situated within this geodemographic group.

NIGECS Groups	License Revocation Rates (%)
Conventional Green Towns	16
Underprivileged Green Towns	17
Flourishing Green Towns	14
Struggling Green Towns	9
Moderately Emerging Localities	0
Comfortable Emerging Localities	10
Transient Emerging Localities	5
Constrained Intermediate Territories*	100*
Well-to-do Intermediate Territories	21
Deprived Intermediate Territories	33
Customary Intermediate Territories	15
Thriving Diluted Societies	6
Laboring Diluted Societies	0
Deprived Diluted Societies	0
Modest Diluted Societies	14
Toiling Country Dwellings	0
Deprived Country Dwellings	0
Middle-class Country Dwellings	0
Prosperous Urban Nodes	15
Disadvantaged Urban Nodes	8
Average Urban Nodes	19
Affluent Urban Nodes	17
Striving Urban Nodes	14

There was only one community bank located within Constrained Intermediate Territories before the implementation of the reforms. The license of this bank was revoked.

While Deprived Intermediate Territories can only be found in 3 states (Akwa-Ibom, Ebonyi and Enugu) and 16 LGAs, some of the key geodemographic features of their residents suggest the likelihood greater

requirement for the microfinance services and social safety nets. In brief, these LGAs are characterized by very high proportions of unmarried people and a significant representation of single parent households. Deprived Intermediate Territories also feature a slightly above average presence of older people. Alongside Well-to-do Intermediate Territories, Deprived Intermediate Territories have the highest incidence of widowed population. Household sizes of over 5 people are quite common within the areas.

4. Local Needs and Local Supply: Any Obvious Relationships?

The best way to quantify need for microfinance service is to embark on a consultation that asks participants direct questions relating to the topic. However, in the absence of detailed information from such surveys, one can examine the mandates and targets for Nigerian microfinance banks listed in section 1 and enshrined in the policy frameworks released by the CBN. A number of indicators from national surveys can be used as proxy measures of these mandates, and, consequently measures of need for microfinance support.

The variables used to assess potential demand for microfinance were obtained from the 2006 Core Welfare Indicators Questionnaire survey deployed by the NBS. They are aligned under three headings, which link with some of the key issues to be addressed by the banks. The headings are "poverty and wealth", "socio-economics" and "employment".

In the remaining sections of this article, reference is made to index values derived according to the equation below for different geodemographic typologies:

$$I = \left[[n/\sum_{1}^{k} n] \div [N/\sum_{1}^{k} N] \right] \times 100$$

Where:

I = the Index
n = the count of households with a characteristic, say quintile 1 in geodemographic cluster k
k = the total number of geodemographic clusters
N = the count of households in geodemographic cluster k

The indices were computed such that an index score of 100 indicates a level of occurrence of that variable, such as poverty quintile 1, equal to the national mean or expected level. A geodemographic typology with an index of 150 would indicate a level 50% above the national average and a score of 200 twice the expected rate (Harris et al., 2005).

4.1 Poverty and Wealth and Supply of Microfinance

Within the poverty and wealth theme, the following variables were analyzed:

- Poorest – households in poverty quintile 1 (poorest 20%)
- Poor – households in poverty quintile 2 (next 20%)
- Middle – households in poverty quintile 3 (next 20%)
- Rich – households in poverty quintile 4 (next 20%)
- Richest – households in poverty quintile 5 (wealthiest 20%)

From Figure 4, NIGECS is able to discriminate for the relationship between residential neighborhood type and economic status. Results from the analysis suggest that, if an initiative was aimed at the poorest fifth of households selected at random, the likelihood of reaching the target household is highest for:

- Country Dwellings (48% above the national mean)
- Intermediate Territories (45% above the national mean)
- Diluted Societies (40% above the national mean)

Additional analysis at the group level of NIGECS provides even greater context. Results in Table 3 conform to the pattern of findings at the super-group level. All groups within Intermediate Territories, Diluted Societies and Country Dwellings record values above the national mean. However, there are variations in the magnitudes of the patterns of these indices. The chance of targeting the poorest households within Deprived Diluted Societies and Deprived Intermediate Territories is almost treble the national mean distribution while that of Deprived Country Dwellings is about double the national average.

In addition to the five poverty quintiles, a composite of the quintiles has been created for each LGA as a measure of relative deprivation. The composite indicator called Standardized Welfare Scores (SWS) was derived by calculating performance magnitudes for each LGA across each of the five quintiles. The performance magnitudes were subsequently standardized using a range standardization technique (Ojo and Ezepue, 2012).

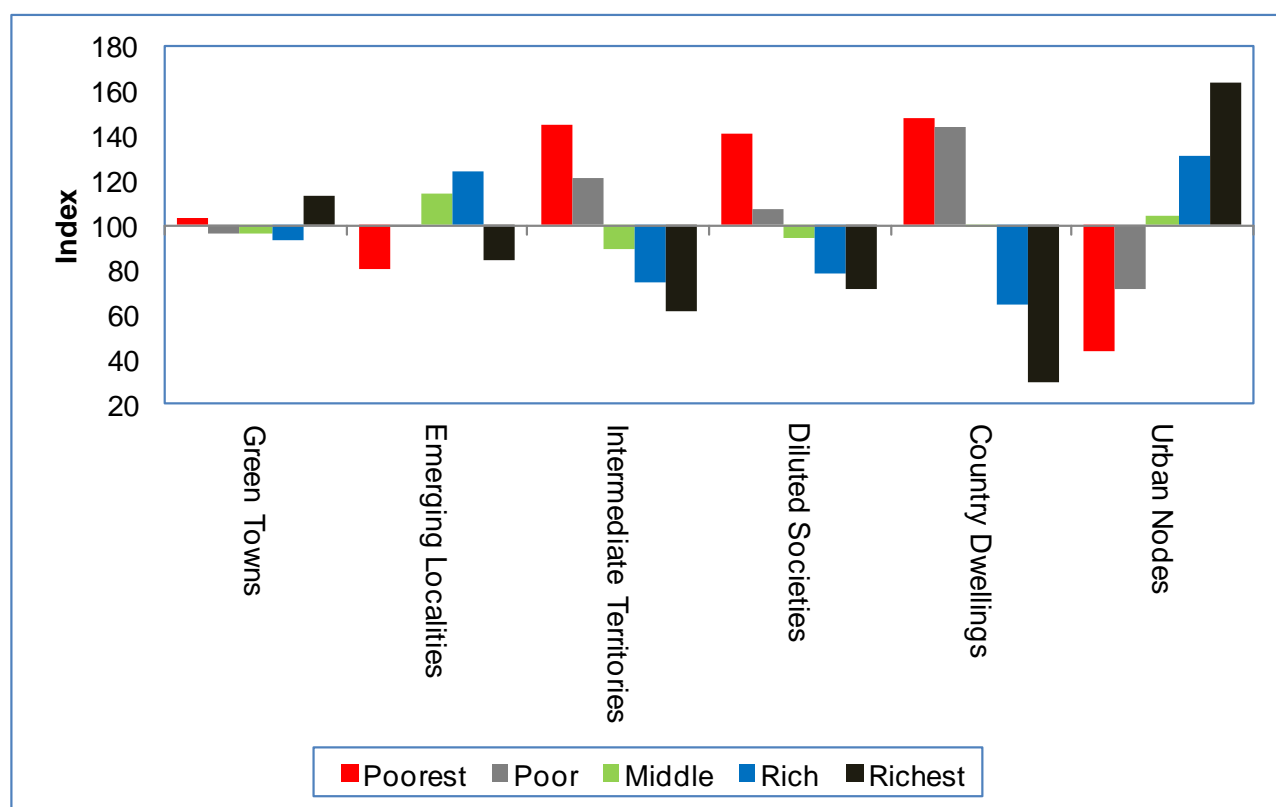### Figure 4: Penetration of Microfinance Banks by NIGECS Groups

Rates at Which Licenses Were Lost by NIGECS Super-groups

NIGECS Group	Poorest	Poor	Middle	Rich	Richest
Conventional Green Towns	113	87	97	97	106
Underprivileged Green Towns	123	105	101	72	94
Flourishing Green Towns	99	86	100	104	114
Struggling Green Towns	90	104	90	93	125
Moderately Emerging Localities	76	100	113	130	83
Comfortable Emerging Localities	78	101	126	132	63
Transient Emerging Localities	87	96	105	111	103
Constrained Intermediate Territories	192	116	96	51	27
Well-to-do Intermediate Territories	117	118	85	89	87
Deprived Intermediate Territories	258	103	63	27	25
Customary Intermediate Territories	126	138	107	77	41
Thriving Diluted Societies	102	94	94	86	127
Laboring Diluted Societies	138	121	100	78	53
Deprived Diluted Societies	271	95	56	29	23
Modest Diluted Societies	121	104	103	92	75
Toiling Country Dwellings	153	138	92	72	31
Deprived Country Dwellings	202	144	65	37	31
Middle-class Country Dwellings	140	146	107	64	30
Prosperous Urban Nodes	33	65	103	124	193
Disadvantaged Urban Nodes	49	67	81	118	201
Average Urban Nodes	64	62	81	127	180
Affluent Urban Nodes	39	75	118	138	142
Striving Urban Nodes	50	82	90	121	170

Figure 5:   **Percentile Ranking of Standardised Welfare Scores**

SWS Deciles
- 0 - 10 (Most Deprived)
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50
- 51 - 60
- 61 - 70
- 71 - 80
- 81 - 90
- 91 - 100 (Least Deprived)
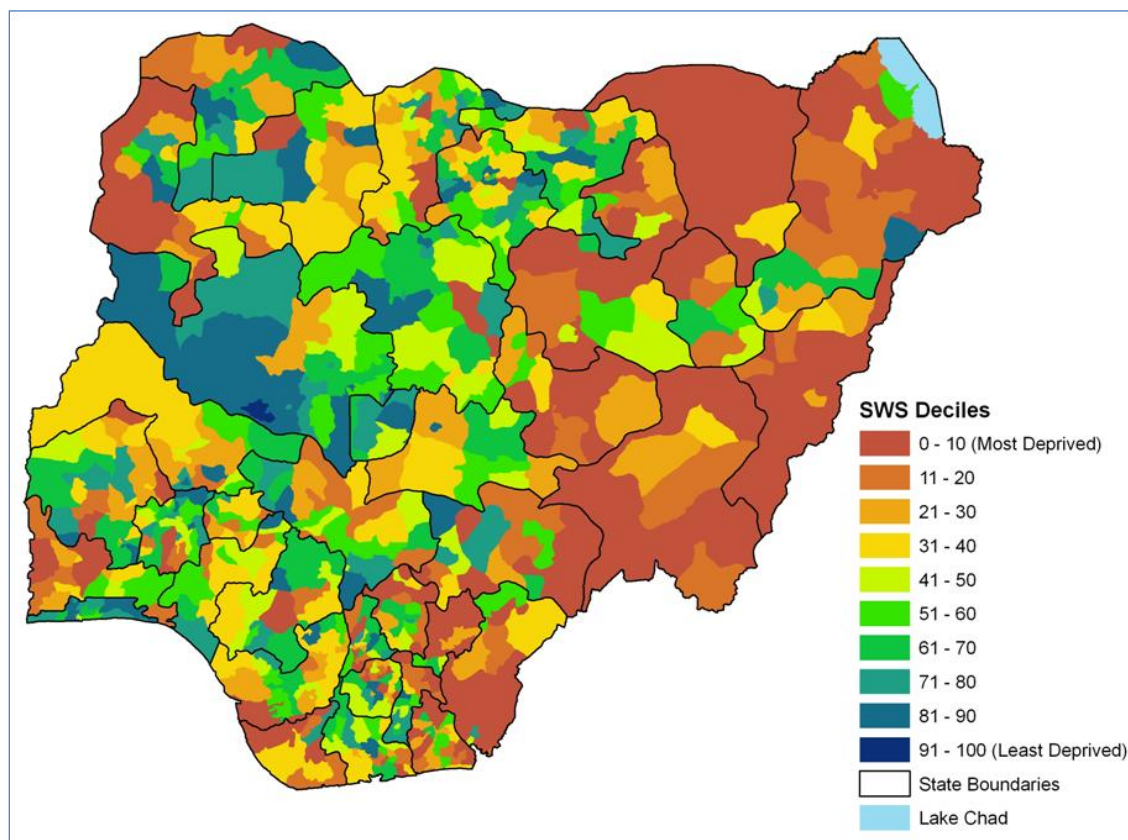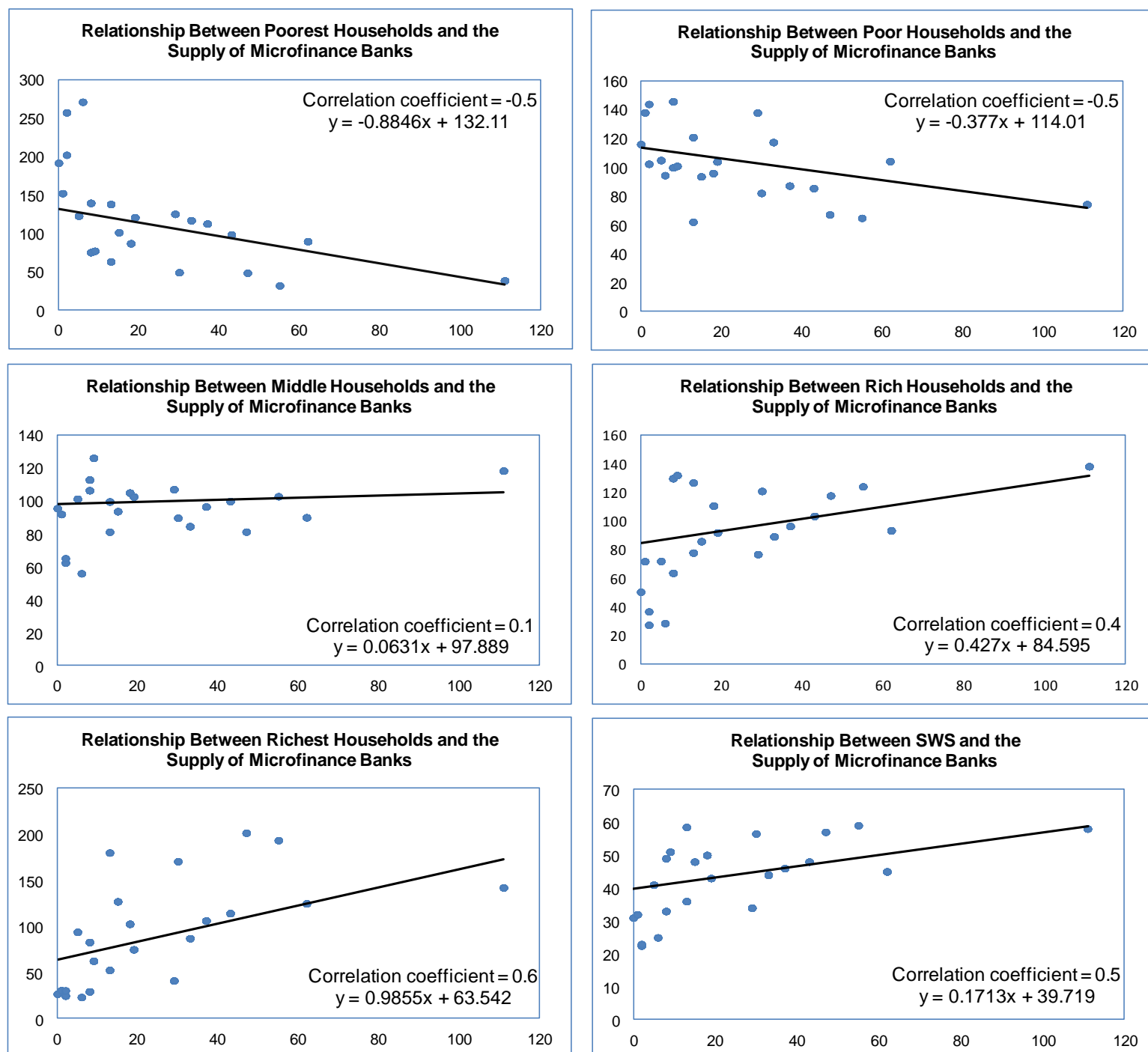- State Boundaries
- Lake Chad

Figure 5 above shows the spatial distribution of relative poverty when the SWS are ranked across ten deciles. Evidence from the map suggests that relative levels of deprivation are greatest in the eastern half of Nigeria and appear to concentrate in the North East. Results from the model conform to findings of earlier work done at regional and state levels (UNICEF, 2009; NBS, 2005). The LGA dimension of the analysis discussed in this article makes it novel and more relevant to community-level decision-making, policy development and deployment.

Spearman rank correlation method was used to test the direction and strength between the supply of microfinance and the six criteria of need. Results are shown in Figure 6:

Figure 6:	Relationship between Poverty and Wealth Variables and Modeled Supply of

Relationship Between Poorest Households and the Supply of Microfinance Banks
Correlation coefficient = -0.5
y = -0.8846x + 132.11

Relationship Between Poor Households and the Supply of Microfinance Banks
Correlation coefficient = -0.5
y = -0.377x + 114.01

Relationship Between Middle Households and the Supply of Microfinance Banks
Correlation coefficient = 0.1
y = 0.0631x + 97.889

Relationship Between Rich Households and the Supply of Microfinance Banks
Correlation coefficient = 0.4
y = 0.427x + 84.595

Relationship Between Richest Households and the Supply of Microfinance Banks
Correlation coefficient = 0.6
y = 0.9855x + 63.542

Relationship Between SWS and the Supply of Microfinance Banks
Correlation coefficient = 0.5
y = 0.1713x + 39.719

A number of deductions can be made from the results presented above. First, from the fitted regression equations, we note that the intercept (the value of y when x = 0; where y is the predisposition for a household to be in a particular quintile and x is microfinance outreach) diminishes with increasing economic status. For instance

- As the supply of microfinance tends to nil, the predisposition for households to be in the poorest quintile is moderately high (an index of 132).
- As the supply of microfinance tends to nil, the predisposition for households to be in the poor quintile is above average (an index of 114).
- As the supply of microfinance tends to nil, the predisposition for households to be in the middle quintile is below average (an index of 98).
- As the supply of microfinance tends to nil, the predisposition for households to be in the rich quintile is below average (an index of 84).
- As the supply of microfinance tends to nil, the predisposition for households to be in the richest quintile is moderately low (an index of 64).

These findings support statements that, if microfinance is viewed as an important strategy for raising economic and living standards, then geodemographic information can help to target provision of microfinance services to populations in need.

In terms of the relationship between the location of service providers and the likelihood of requirement for microfinance services, the flip side of the results point to worrying trends. At the LGA scale, the location of the poorest and poor households is negatively associated with the supply of microfinance services. In contrast, middle, rich and richest households have positive relationships with microfinance supply. These findings suggest that the supply of microfinance services decreases with increasing propensity for households to be poor, at the LGA scale.

4.2 Socio-economics and Supply of Microfinance

The following variables were used to quantify the magnitude of local socio-economic needs:

- Difficulty in satisfying food needs
- Difficulty in paying school fees
- Difficulty in paying house rent
- Difficulty in paying utility bills
- Difficulty in paying for health care
- Irregular pension payment

Results of analysis conducted at the super-group level are shown in Figure 7. There are marked variations in the types and levels of socio-economic needs across the typologies.

Figure 7:   Profile of Socio-economic Variables by NIGECS Super-groups
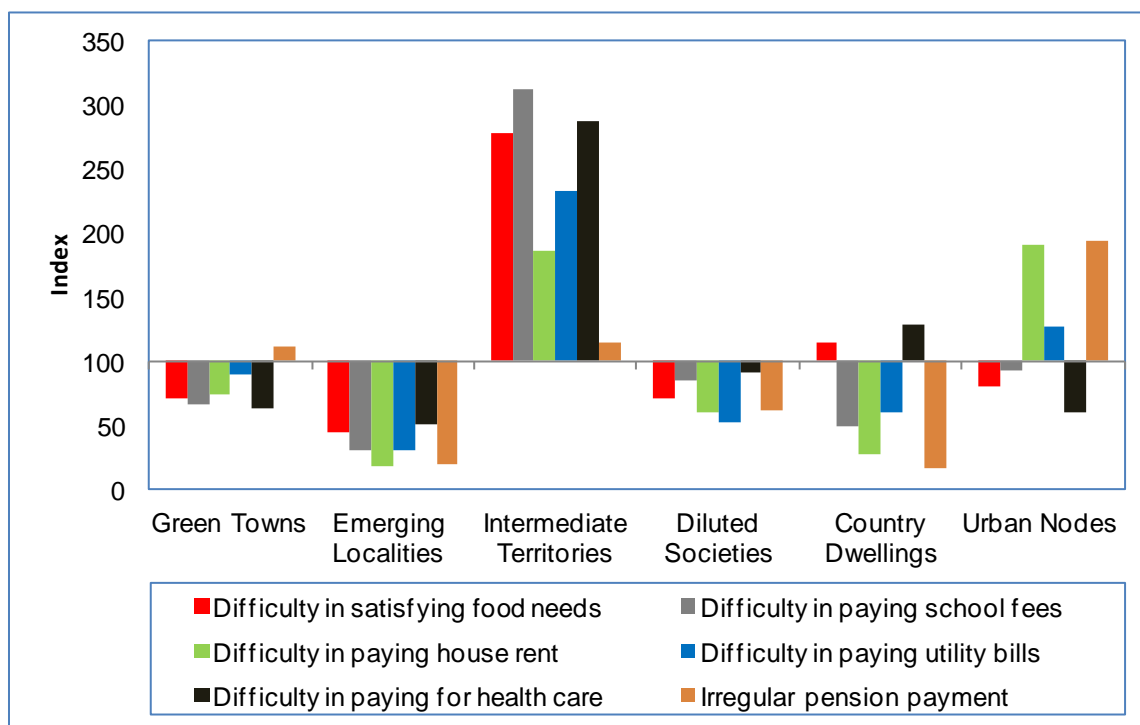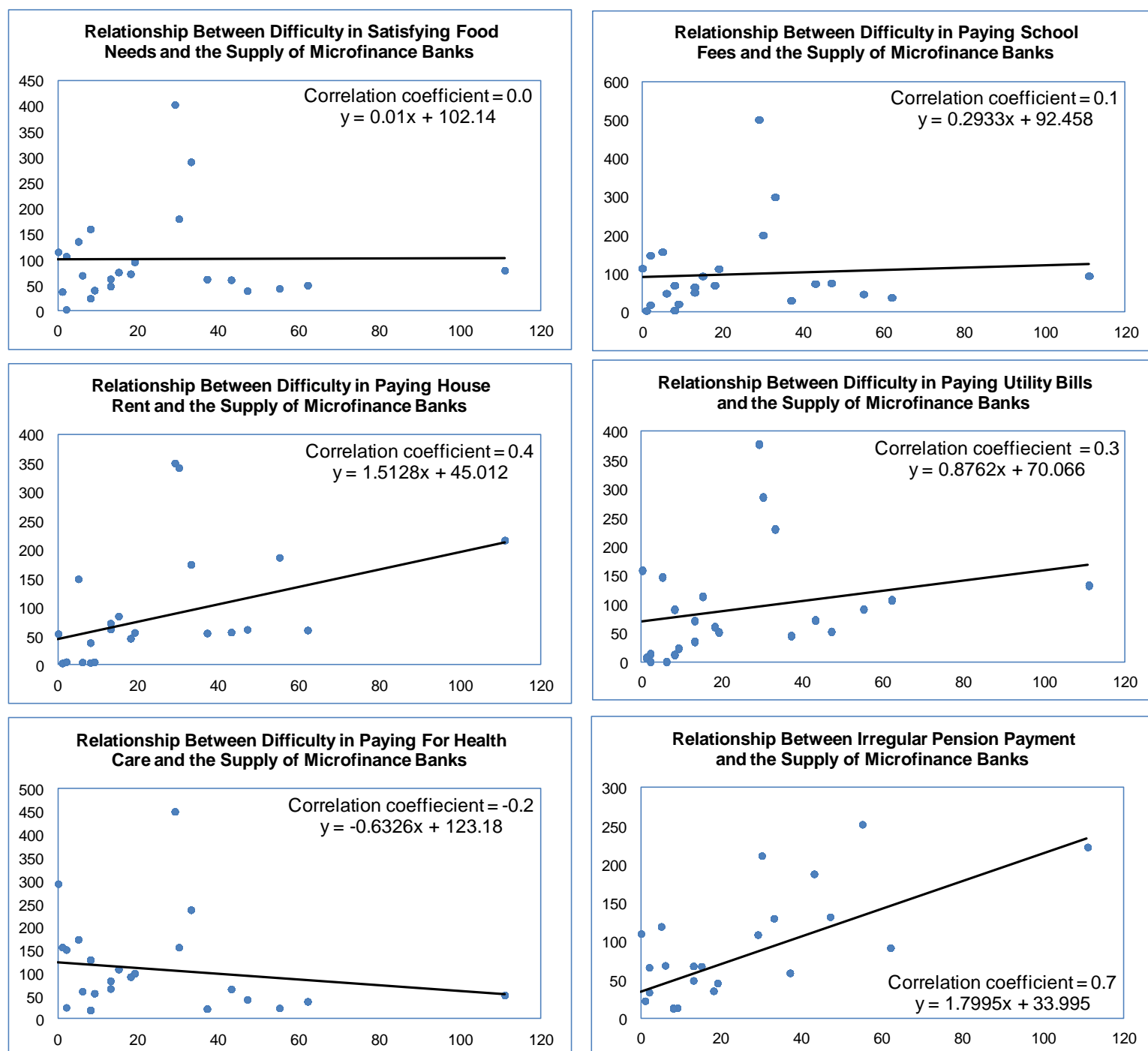
Figure 7 is a profile of the socio-economic variables considered. Intermediate Territories is the only super-group with higher than average indices for all variables. For instance, parents and guardians within these areas have significantly higher levels of difficulty paying the school fees of their wards. The difficulty level is more than treble what is expected. Residents of Intermediate Territories also have challenges with meeting requirements for food needs, paying for health care and paying utility bills at double the national average rates. Ironically, microfinance license revocation rates stands at 20% with microfinance supply standing at only 11%.

Figure 8: **Relationship between Socio-economic Variables and Modeled Supply of Microfinance**

Relationship Between Difficulty in Satisfying Food Needs and the Supply of Microfinance Banks — Correlation coefficient = 0.0, y = 0.01x + 102.14

Relationship Between Difficulty in Paying School Fees and the Supply of Microfinance Banks — Correlation coefficient = 0.1, y = 0.2933x + 92.458

Relationship Between Difficulty in Paying House Rent and the Supply of Microfinance Banks — Correlation coefficient = 0.4, y = 1.5128x + 45.012

Relationship Between Difficulty in Paying Utility Bills and the Supply of Microfinance Banks — Correlation coeffiecient = 0.3, y = 0.8762x + 70.066

Relationship Between Difficulty in Paying For Health Care and the Supply of Microfinance Banks — Correlation coeffiecient = -0.2, y = -0.6326x + 123.18

Relationship Between Irregular Pension Payment and the Supply of Microfinance Banks — Correlation coefficient = 0.7, y = 1.7995x + 33.995

Socio-economic indices were also computed across the NIGECS groups and correlated with the supply of microfinance banks to produce the scatter plots shown in Figure 8.

The requirement for food satisfaction and the supply of microfinance have zero correlation. Both variables are statistically independent of each other. This probably explains why the predisposition for households to have difficulty in meeting their food needs is very close to expected distribution (an index of 102) as the supply of microfinance tends to nil.

The supply of microfinance services varies positively with difficulty in paying school fees. However, this positive association explains only 1% of the variance between the variables in common.

The positive relationship between difficulty in paying house rent and supply of microfinance shows about 16% of the variance is in common. As the supply of microfinance tends to nil, the tendency for a household to have difficulty in paying house rent is generally low (an index of 45). In other words, the supply is greater in areas with more difficulty in paying rent.

Although the supply of microfinance also increases with difficulty in paying utility bills, the supply rate is higher for difficulty in paying house rent. As the supply of microfinance tends to nil, households find it difficult to pay for utility bills at moderately low rates (an index of 70).

The only negative association is the association between microfinance supply and the payment for health care. As microfinance supply reduces, the probability for households to have difficulty in paying their health bills increases. In fact, at the supply tends to nil, difficulty in paying for a health service is moderately high (at 23% above the national mean).

We also observe a high positive association between irregularity in pension payment and microfinance supply. This suggests that service providers are located within areas with higher predisposition for pensioner households. As a result, even when the supply of microfinance tends to nil, the problems posed by irregularity in pension payment is generally low. Conversely, this may present an opportunity for microfinance banks to target pensioners with product offerings designed to mitigate problems from irregular payments.
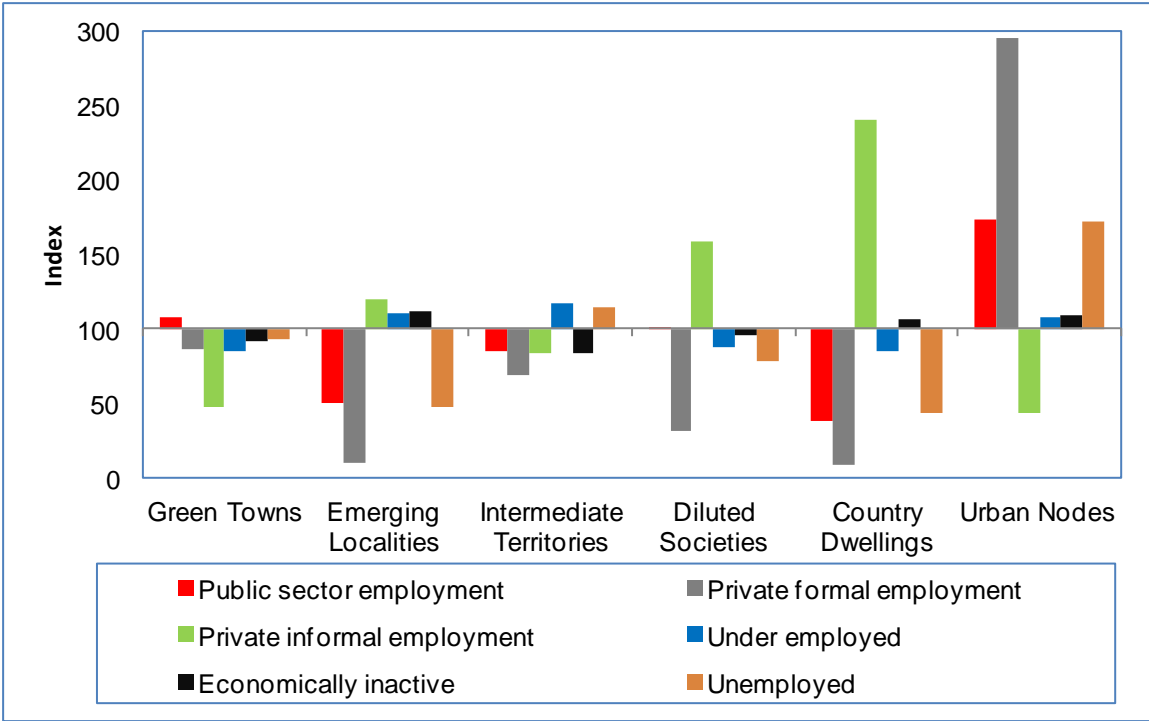
Since non-financial services (such as healthcare) are considered by many to be an important component of delivering on the social goals of microfinance, testing these relationships can help to identify opportunities (or the lack thereof) for such services.

| 4.3 | Employment and Supply of Microfinance |

Within the employment domain, the following variables were considered in relation to the supply of microfinance:

- Public sector employment
- Private formal employment
- Private informal employment
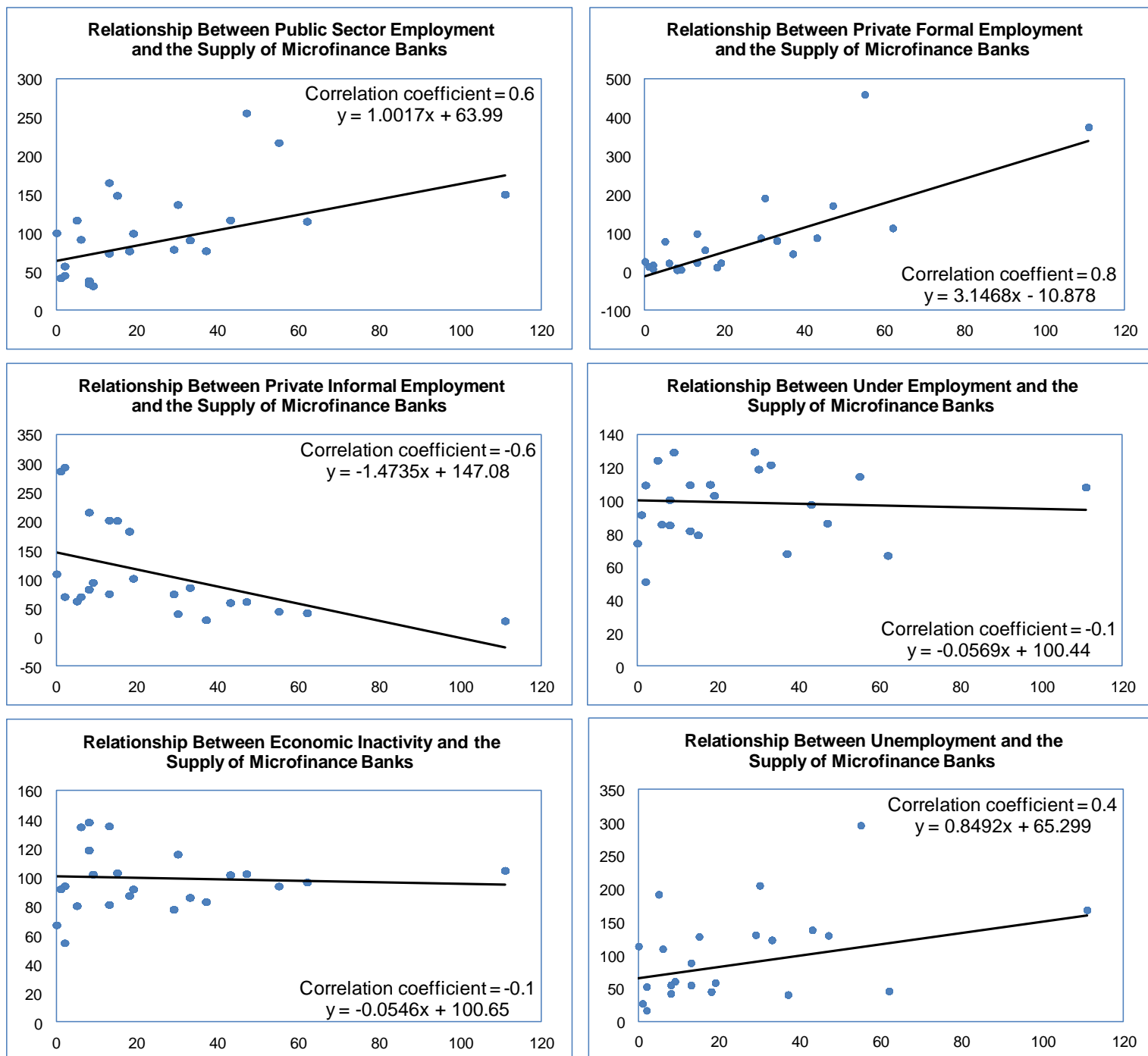- Under employed
- Economically inactive
- Unemployed

| Figure 9: | Profile of Employment Variables by NIGECS Super-groups |

In Figure 9, we see marked variations in the predisposition of residential neighborhood type to different employment variables. Although residents of Green Towns are most likely to be employed in the public sector, their Urban Node counterparts have far greater affinity with the public sector. However, residents of Urban Nodes are likely to be engaged in private formal employment at almost treble the national average distribution rates. Due to high levels of rural-urban migration typical in most African countries, high levels of unemployment are also noticeable within the Urban Nodes. The only other super-group with higher than average unemployment rates is the Intermediate Territories. Intermediate Territories are also characterized by higher than average rates of under-employment.

Figure 10:   Relationship between Employment Variables and Modeled Supply of Microfinance

Relationship Between Public Sector Employment and the Supply of Microfinance Banks

Correlation coefficient = 0.6
$y = 1.0017x + 63.99$

Relationship Between Private Formal Employment and the Supply of Microfinance Banks

Correlation coeffient = 0.8
$y = 3.1468x - 10.878$

Relationship Between Private Informal Employment and the Supply of Microfinance Banks

Correlation coefficient = -0.6
$y = -1.4735x + 147.08$

Relationship Between Under Employment and the Supply of Microfinance Banks

Correlation coefficient = -0.1
$y = -0.0569x + 100.44$

Relationship Between Economic Inactivity and the Supply of Microfinance Banks

Correlation coefficient = -0.1
$y = -0.0546x + 100.65$

Relationship Between Unemployment and the Supply of Microfinance Banks

Correlation coefficient = 0.4
$y = 0.8492x + 65.299$

By analyzing the employment variables across NIGECS groups and comparing to the supply of microfinance, we see differences in the relationship between employment microfinance supplies at the local level.

The strongest positive relationship is evident between formal employment in the private sector and the supply of microfinance. Why do service providers have significantly high association with these groups of people? Is it because they are more likely to yield greater returns on investment? Could their level of education be a determining factor? Are microfinance banks started or owned by members of this group? These questions call for further analysis.

One would expect microfinance service providers to aim at strengthening the informal economy. However, the strong negative correlation between private informal employment and microfinance supply tells a different story.

On the other hand, suppliers of microfinance services may argue that they are meeting at least one of their statutory requirements of targeting unemployed persons. This position is bolstered by the positive relationship between unemployment and the supply of microfinance. However, this result needs to be interpreted with a sense of caution. The positive correlation is explained by the concentration of unemployed persons within Urban Nodes (see Figure 9). While it may be argued that unemployment is disproportionately concentrated in urban centers, one cannot rule out the presence of this problem in rural vicinities as well. How do microfinance suppliers cater for the rural unemployed? Answers to this question again require further analysis.

5. Summary

This article has been used to demonstrate the power of the Nigerian geodemographic system in uncovering opportunities for more appropriate and efficient service delivery based on customers likely needs. One of the benefits of the analysis is the development of a knowledge base that more effectively prioritizes local needs and meets the expectations of residents. This will ultimately lead to more satisfied residents.

The broader implications of these analyses and visualizations need to be appraised with regard to influencing change and reducing welfare inequality at the local level. The techniques also provide intelligence to validate and exemplify the aptness of resource allocation. This is of particularly relevance to funding policy initiatives tied to specific community programs aimed at tackling Nigeria's poverty challenge.

The study has shown that local level disparities exist in the supply of microfinance for different community types. Using proxy indicators, the study has also demonstrated that the requirement for microfinance varies at different levels across these community types. From the preliminary findings reported here, it appears residents located in neighborhoods of greater need are underserviced. Apart from trying to respond to respond to urban unemployment, the banks appear to be located in areas where they are unlikely to meet other key mandates, such as raising the living standards of the rural and semi-rural poor.

Supplementary advanced analysis needs to consider spatial proximity measures of dissimilarity, interaction, isolation and exposure to provide even more robust insight on these preliminary findings. Additionally, further investigation is required to understand why service providers are located where they are and how uptake can be improved for residents at disadvantaged locations

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