

DETERMINANTS OF INCOME DIVERSIFICATION IN ILORIN METROPOLIS, NIGERIA

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Abstract: This paper examines the determinants of income diversification in Ilorin metropolis, using a collection of household data, the Simpson Index of Diversity (SID) as a measure of income diversity, a multiple regression analysis of the Ordinary Least Square and qualitative social assessment method. The result obtained indicates that factors like household size, marital and educational status of the respondents, their access to electricity, commodity markets, health care services and information have to some extent influenced income diversification, with variables like the gender and age of the respondents, their residential location, access to social capital, their income, access to credit markets having little or no influence on the outcome of the study, because they fall short of our a-priori expectations. Given these results measures such as the improvement in the existing electricity supply system, improvement and maintenance of road networks and the means of traveling to markets, provision of health care services and security, provision of information on the condition of the market, prevailing prices and types of commodities, promotion of social capital and the improvement and expansion of the existing credit market in the metropolis were suggested.

Key words: Income, Diversification, Ilorin

1. INTRODUCTION

The continuous increase in poverty in Nigeria¹, the dwindling nature of income of individual, the increase in the rate of inflation², the deteriorating state of the nation's economy, especially with the introduction of structural adjustment programme in the mid 1980s³ has over the years made most people, especially low income earners engaged themselves in other type of occupations than their main occupation in order to supplement their income. This strategy of supplementing income from other jobs, often referred to as income diversification is a form of risk management strategy aimed at cushioning the effects of shocks (economic and agro-climate), poverty reduction, reduction in income inequality, consumption stability and over all improvement in the standard of living of the

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key public assets such as electricity, roads, sewage, or drinking water. Finally, z_i includes other key assets that relates to the characteristics of the area (agro-climate, land quality, etc).

(c) Significance of Income Diversification

Drawing instances from the agrarian society, Minot, *et al.* (2006) states that most rural households adopt multiple income generating activities in order to manage risk in terms of weather change or other factors, to meet household consumption needs in the face of high transaction costs, to take advantage of positive externalities among activities, and to respond to diseconomies of scale. Diseconomies of scale can, in turn, be caused by land constraints, seasonal variation in agricultural labour productivities and heterogeneous skills in the household (see also Barrett and Reardon 2000).

Studies by Escobal (2001) and Adugna (2006) also indicates that households that depend heavily on agriculture and related activities also benefited from income diversification. For instance, income diversification through off-farm activities offer an important route out of poverty, provide higher income earning, increase food consumption, generate employment and reduce income inequality. Ersado (2006) also reiterate that income diversification is a key way of ex-ante risk management or ex-post coping with shocks. And that there are several factors responsible for observed income diversification at the household level. These factors include among others: (i) self-insurance against risk in the context of missing insurance and credit markets; and (ii) an ex-post coping strategy with extra individuals and extra jobs taken because of the decline in income (see also Barrett and Reardon 2000; Barrett *et al.* 2001).

Very few evidence on the role of income diversification exists in the urban areas. But in most rural areas of developing countries, diversification into non-farm income source is growing and accounts for a considerable share of household income. In an extensive analysis of household survey from 1970s through the 1990s, it was discovered that average non-farm income share was 42 per cent in Africa, 40 per cent in Latin America and 32 per cent in Asia. Many studies in Africa find positive association between non-farm diversification and household welfare and also discovered that income diversification is a coping strategy used during times of drought, like what was experienced in Burkina Faso before and after the 1984 drought, where households with greater income diversification were able to buy food and weather the effects of the drought and tend to have higher overall incomes than those who were not able to supplement their farm incomes with rural non-farm incomes (Barrett and Reardon 2000; Ersado 2006).

3. STUDY AREA AND METHODOLOGY

3.1. Study Area

Ilorin is located some 300 kilometers from Lagos and 500 kilometers from Abuja the Federal Capital of Nigeria and on Latitude North $8^{\circ}30'$ and Longitude East $4^{\circ}35'$ of the Equator. The city is situated in the transition-zone between the forest and savanna regions

of Nigeria. Presently the city is the capital of Kwara State in Nigeria and has an estimated population (by 1991 census figure) of about 572,178 people (NPC 1993, Ijaiya and Umar 2004).

3.2. Methodology

(a) Data Source

In addition to the use of secondary data, a survey aimed at generating primary data on the determinants of income diversification in Ilorin metropolis was conducted between the month of January and February 2009 through the distribution of copies of questionnaire and Qualitative Social Assessment of Income Diversification (QSAID). The questionnaire was based on the World Bank Living Standards Measurement Study (LSMS) and the Nigeria's National Bureau of Statistics' National Integrated Surveys on Households, which among other things provided questions on the socio-demographic characteristics of the households and the description of the patterns of access to social services. The QSAID provides more in-dept information on the perceptions, experiences and constraints to income diversification (Grootaert 1986; Minot *et al.* 2006).

(b) Sample Selection Method

A stratified sampling method was used in the selection of the respondents for the study. For the purpose of these study, 11 locations within the metropolis served as the sample units⁴. In accordance with these sample units, a structured questionnaire was distributed to about 193 heads of households in the metropolis of which 170 responded. The issues raised in the questionnaire included the background of the respondent (i. e. age, gender, martial, educational and employment status, household size and composition), income level and source(s) including which source(s) have become more or less important over time and perception of the important income source(s), the relative contribution of the factors like household's geographic location, headship of household, availability of infrastructural facilities, e.g. good road network, electricity, health care facilities and information, access to commodity and credit markets, human and social capital to income diversification, their perceptions and experiences regarding income diversification, the role of the government in promoting new economic activities, including questions about the types of assistance rendered and the usefulness of the assistance.

(c) Data Analysis

Both qualitative and quantitative methods were used in analyzing the data collected for the study. The qualitative analysis was based on the perception of the respondents on the determinants of income diversification in Ilorin metropolis. The quantitative method comprises the use of descriptive analysis, the Simpson Index of Diversity used in measuring income diversity and a multiple regression analysis in determining the relative contribution of the factors that determine income diversification in Ilorin metropolis.

Descriptive statistics such as per centile was used in describing the socio-demographic characteristics of the respondents. The analysis of income diversification in this study is in line with that adopted by Minot, et.al (2006), that views income diversification as multiple sources of income. Typical of such method is Simpson Index of Diversity defined as:

$$SID_i = 1 - \sum P_i^2 \quad (1)$$

Where:

P_i = the proportion of income coming from source

The value of SID_i falls between 0 and 1. If there is just one source of income $P_i = 1$, so $SID_i = 0$. As the number of sources increases, the shares of (P_i) declines, as does the sum of the squared shares, so that SID_i approaches 1. If there are k sources of income, then SID_i falls between zero and $1 - 1/k$.

Drawing from Escobal's (2001) standard rural household model of the determinants of income diversification, which was based on the "push" or "pull" factors, we therefore modify and specify our model using a multiple regression analysis of the Ordinary Least Square (OLS) in verifying the relative contribution of the factors that determine income diversification in Ilorin metropolis. The factors considered in this study were divided into two main groups: factors that are household based and those that are community based. Those that are household based are referred to as the vector of household characteristics, which include household size, gender of the respondents, location of the residence of the respondents, age, marital and educational status and income of the respondents from their main occupation; and those that are community based are referred to as vector of community characteristics which include social capital measured by membership of an association, access to electricity, access to commodity markets, access to credit markets, access to health care services and access to information. Thus, following Escobal (2001) and Minot *et al.* (2006) methods of estimation, the model for this study is stated as:

$$ID_i = f(HHc_i, Cc_i) \quad (2)$$

Where:

ID_i = measure of individual respondent's income diversity.

HHc_i = the vector of household characteristics represented by the following equation:

$$HHc_i = f(Hhs_i, GHhH_i, Loca_i, Age_i, Mastus_i, Edu_i, Soca_i, Incom_i) \quad (3)$$

Cc_i = the vector of community characteristics represented by the following equation:

$$Cc_i = f(Elec_i, Comkt_i, InCremkt_i, HethCs_i, Infor_i) \quad (4)$$

Thus, when equations (3) and (4) are substituted into equation (2), it then becomes:

$$ID_i = f(Hhs_i, GHhH_i, Loca_i, Age_i, Mastus_i, Edu_i, Soca_i, Incom_i, Elec_i, Comkt_i, InCremkt_i, HethCs_i, Infor_i) \quad (5)$$

When transformed into a multiple linear relationship, equation (5) thus becomes:

$$ID_i = \alpha_0 + \alpha_1 Hhs_i + \alpha_2 GHhH_i + \alpha_3 Loca_i + \alpha_4 Age_i + \alpha_5 Mastus_i + \alpha_6 Edu_i + \alpha_7 Socia_i + \alpha_8 Incom_i + \alpha_9 Elec_i + \alpha_{10} Comkt_i + \alpha_{11} lnCremkt_i + \alpha_{12} HethCs_i + \alpha_{13} Infor_i + Z \quad (6)$$

Where:

- Hhs_i = household size of individual respondent.
- $GHhH_i$ = gender of the head of household. Binary variable 1 for household headed by male and 0 for otherwise.
- $Loca_i$ = location of the residence of individual respondent. 1 for traditional settlement and 2 for modern settlement.
- Age_i = age of individual respondent.
- $Mastus_i$ = marital status of individual respondent. 1 for single, 2 for marriage, 3 for widow/widower and 4 for divorce/separated.
- Edu_i = educational status of individual respondent. 0 for no school, 1 for primary school, 2 for secondary and 3 for tertiary.
- $Socia_i$ = social capital measured by membership of an association. 1 for membership and 0 for otherwise.
- $Incom_i$ = log of income of individual respondent from main occupation.
- $Elec_i$ = access to electricity measured by the number of hours electricity is made available per day.
- $Comkt_i$ = access to commodity market measured by the distance of residence to the nearest market.
- $lnCremkt_i$ = log of access to the credit market measured by the amount of fund received from a credit institution in the last three month.
- $HethCs_i$ = access to health care services measured by the distance of residence to the nearest health care facility.
- $Infor_i$ = access to information proxied by the most available medium for accessing information. 0 for no access, 1 for town crier, 2 for radio, 3 for television and 4 for newspaper.

α_0 = the intercept.

α_1 — α_{13} = estimation parameters.

U = disturbance term.

To estimate the model, a multiple linear regression analysis was used in order to reflect the explanatory nature of the variables. To verify the validity of the model, two major evaluation criteria were used: (i) the *a-priori* expectation criteria which is based on the signs and magnitude of the co-efficient of the variables under investigation; and (ii) statistical criteria based on statistical theory which in other words is referred to as the First

Order Least Square Test, which consist of R-square (R^2), F- statistic and t- test among others. The R-square (R^2) is concerned with the overall explanatory power of the regression analysis, the F-statistic is used to verify the overall significance of the regressors and the t-test is used to verify the marginal contribution of each of the independent variables. (Oyeniyi 1997; Greene 2003).

Drawn from the model, our *a-priori* expectations of the expected pattern of behaviour of the independent variables on the dependent variable are:

$$\alpha_1 > 0; \alpha_2 < 0; \alpha_3 < 0; \alpha_4 > 0; \alpha_5 > 0; \alpha_6 > 0; \alpha_7 > 0; \alpha_8 > 0; \alpha_9 > 0; \alpha_{10} > 0; \alpha_{11} > 0; \alpha_{12} > 0; \alpha_{13} > 0.$$

4. RESULTS AND DISCUSSION

(a) Socio-demographic Characteristics of the Respondents

The socio-demographic characteristics of 170 respondents in Ilorin metropolis included in the analysis are presented in Table 1. The survey conducted on the respondents in Ilorin metropolis indicated that 45.9 per cent of them live in the traditional settlements, and 44.6 per cent of them fall within the 31- 40 years age bracket, with 88.8 per cent of them married. About 57.1 per cent of them are males, with 46.5 per cent of them having a household size of between 6 and 10. The survey also indicated that 60 per cent of the respondents are engaged in the organized public sector, with 52.1 per cent of them not engaged in any other occupation than their main job and only 7.1 per cent of them having a minimum of primary school education.

(b) Results of the Multiple Regression Analysis of Income Diversification in Ilorin Metropolis

The results of the multiple regression analysis conducted at 5 per cent level of significance are presented in Table 2. These results are further confirmations of the relative contribution of the factors that determine income diversification in Ilorin metropolis.

A look at the model shows that it has an R-square of 0.31. This shows that 31 per cent variation in the dependent variable is explained by the explanatory variables, while the error term takes care of the remaining 69 per cent that are variables in the study that cannot be included in the model because of certain qualitative features. At 5 per cent level of significance, the F-statistic shows that the model is useful in determining if the explanatory variables have any significant influence on the dependent variable, as the computed F-statistic which is 6.55 is greater than the tabulated F-statistic valued at 1.75.

In terms of the individual independent variables, the co-efficient estimates and the associated t-values of the size of household of the respondents, their marital and educational status, their access to electricity, the commodity markets, health care services and information all have the expected signs, thus fulfilling our *a-priori* expectations.

$$ID_i = \alpha_0 + \alpha_1 Hhs_i + \alpha_2 GHhH_i + \alpha_3 Loca_i + \alpha_4 Age_i + \alpha_5 Mastus_i + \alpha_6 Edu_i + \alpha_7 Soca_i + \alpha_8 Incom_i + \alpha_9 Elec_i + \alpha_{10} Comkt_i + \alpha_{11} InCremkt_i + \alpha_{12} HethCs_i + \alpha_{13} Infor_i + Z \quad (6)$$

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In terms of the individual independent variables, the co-efficient estimates and the associated t-values of the size of household of the respondents, their marital and educational status, their access to electricity, the commodity markets, health care services and information all have the expected signs, thus fulfilling our *a-priori* expectations.

Table 1
Socio-demographic Characteristics of the Respondents

<i>Characteristics</i>	<i>Percentage (%)</i>
a. Location of the Respondents	
Traditional Settlements	45.9
Modern Settlements	54.1
b. Gender of the Respondents	
Male	57.1
Female	42.9
c. Age of the Respondents	
Below 30	25.4
31-40	44.6
41-50	28.2
Above 50	1.8
d. Marital Status of the Respondents	
Single	11.2
Married	88.8
Divorced	-
Widow	-
e. Household Size of the Respondents	
1-5	49.9
6-10	46.5
More than 10	3.6
f. Main Occupation of the Respondents	
Unorganized Private Sector (Informal Sector) Employed	13.8
Organized Private Sector	26.2
Organized Public Sector	60.0
g. Other Secondary Occupations	
None	52.1
Farming	2.0
Trading	15.1
Transportation (Taxi/ Bus/ Motorcycle)	30.8
h. Educational Status of the Respondents	
No school	5.2
Primary school	7.1
Secondary school	58.9
Tertiary	28.8

Source: Authors' computation 2009

Table 2
Multiple Regression Results of the Determinants of Income Diversification in
Ilorin Metropolis

<i>Explanatory variables</i>	<i>Co-efficient and the t-values</i>
Intercept (t)	0.99 (3.95)
HhS _i (t)	0.032 (0.52)
GthH _i (t)	-0.18 (-4.52)*
Loca _i (t)	-0.029 (-0.71)
Age _i (t)	-0.013 (-4.59)*
Marstus _i (t)	0.36 (5.40)*
Edu _i (t)	0.029 (0.88)
Soca _i (t)	-0.17 (-3.10)*
Incom _i (t)	-0.069 (-2.34)*
Elec _i (t)	0.095 (0.50)
Comkt _i (t)	0.010(1.97)*
InComkt _i (t)	-0.041(-2.21)*
HthCs _i (t)	0.0065(1.31)
Infor _i (t)	0.0022(1.39)
R ²	0.31
F	6.55
No. of Observations	170

* Significant at 5 per cent level of significance.

Statistically, only their marital status (which is dominated by those that are married) and those that have access to commodity markets are statistically significant at 5 per cent level of significance.

The positive signs of the size of household of the respondents, their marital and educational status, their access to electricity, commodity markets, health care services and information are indications of the extent of their positive influence on income diversification in Ilorin metropolis. For household size, a household with a large size, couple with the prevailing economic hardship in the country will not have any option than to search for alternative source of income to supplement those from their main occupation. For educational status, the higher the individual's educational status, the more is the opportunity open for such an individual to change job and to look for additional source of income to augment the existing one. Having access to electricity, commodity markets, health care services and information makes it possible for household members to participate in other form of income generating activities. When electricity are made available (regularly), household members will participate in some form of self-employment and have more diverse income sources and a large share of income from other sources apart from their main job. With access to commodity markets the household

members are faced with low transaction cost in buying or selling and with access to information, available commodities in the markets and their prices will be within reach. Gender and location of the residence of the respondents could either be positive or negative. That the outcome of the regression is negative indicates that the bulk of the respondents that are male and mostly found in the modern settlements did not matter much to the outcome of the study. In other words, the respondents found in the modern settlements and households headed by male are little or not involved in income diversity than those headed by female and found in the traditional settlements.

Drawn from the perception of some of the respondents, their quest for more source of income is caused by the harsh economic situation in the country, the relatively large household size which they must feed and catered for, availability of commodity markets where goods can be brought and sold, but with meager income and poor credit markets, which on the other hand makes income diversification difficult.

These results are in conformity with the study on Vietnam by Minot, *et al.* (2006), where it was established that the education of the household members is significantly and positively related to the number of income sources, since education opens the door to a number of different economic activities, either because of formal requirements for wage earning positions or because education (particularly literacy and numeracy) facilitate learning about new self-employment opportunities and managing them efficiently. For household size, large households with a small proportion of children and elderly people tend to have a large number of income sources.

Age of the respondents, their access to social capital, income from main occupation, access to credit markets did not matter much to the outcome of this study because they fall short of our a-priori expectations. The case of social capital and access to the credit markets seems obvious given the cosmopolitan nature of Ilorin metropolis, where little or no social/kinship networks, reciprocal relationships and trust among the people exist. The lack of access to the credit markets, which should have help boost income diversification can be linked to the people's lack of awareness of the credit services available, their proximity and their reliability in either starting a business or expanding an existing one and the high interest rate and the need for collaterals that comes with the services. These assertions are also in conformity with the views of Ersado (2006) and (Escobal 2001) while comparing income diversification in the rural areas with the urban centers.

5. CONCLUSION AND RECOMMENDATIONS

An empirical study of the determinants of income diversification in Ilorin metropolis was carried out using a collection of household data, the Simpson Index of Diversity (SID) as a measure of income diversity, a multiple regression analysis of the Ordinary Least Square and qualitative social assessment method. Some of the determinants considered for the study are vector of household and community characteristics. The vector of household characteristics includes household size, gender of the heads of households, who were used

as the respondents, location of the residence of the respondents, age, marital and educational status of the respondents. The vector of community characteristics includes social capital measured by membership of an association, income of respondents from their main occupation, access to electricity, access to commodity markets, access to the credit markets, access to health care services and access to information. Of these variables only household size of the respondents, their marital and educational status, their access to electricity, commodity markets, health care services and information have to some extent influenced income diversification in Ilorin metropolis, with variables like the gender and age of the respondents, their residential location, access to social capital, their income, access to credit markets not adding much to the outcome of this study because they fall short of our a-priori expectations.

These results thus call for measures that would in addition to improving the existing electricity supply system in the metropolis, provide access to commodity markets via the improvement and the maintenance of road networks and the means of traveling to the markets, provide health care services that are essential for good health and productivity, provide information on existing markets, prices and commodity conditions, improve and expand the existing credit markets with serious emphasis on interest rate reduction and removal of stringent conditions for credit availability at the informal, semi-formal and formal credit institutions.

Social capital, which emphasizes on membership of associations (trade/communal groups), social/kinship networks, reciprocal relationships and trust among the people should be encouraged, given its importance as a mediator in cementing relations, settling disputes and forging unity among members and as an avenue for providing members financial, social and political support in times of need and as a mechanism for removing fear of fraud and mismanagement that are detrimental to entrepreneurial development.

The government at the level of the state and local government could also be of help in encouraging income diversification efforts via the provision of infrastructural facilities, micro credits, security of life and property for entrepreneurial development in the metropolis.

NOTES

1. The rate of poverty increased from 28.1 per cent in 1980 to about 70.2 percent in 2003 (Adeyemi, et al 2007).
2. For the persistent increase in the rate of inflation in Nigeria see CBN 2005.
3. For the effects of Structural Adjustment Programme see Faruque 1994; Ukpong and Iniedu 1994.
4. The 11 sample units include among others: Oja oba, Gambari, Pakata, Oloje, Okelele, Okesuna, Oki Ecin, Balogun Fulani, Gas Akarhi , Bahoko and Taiwo.

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