

RURAL MARKET ACCESSIBILITY AND CHILD SCHOOL ATTENDANCE IN NIGERIA

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ABSTRACT

The aim of this study is to examine the effect of market day on child labour participation and school attendance. The data-set of 408 respondents were purposively obtained using structured questionnaire on children 10 to 14 years of age who are residents of Tungan-Mallam rural community, and bivariate probit model was applied. Both the basic theoretical model derived and empirical results shows that, earnings from periodic market activities leads to child participation in labour and reduces their school attendance rate especially on market days. Likewise, even with presence of adult in the household, labour supply on the market day tend to be high due to excessive demand for child labour coupled with lower wage payment when compared to adult wage. The study recommends a strict school attendance especially on the market days with a decisive punishment of class repetition, while general awareness to both parents and children on the danger associated with child labour should be encouraged at intervals.

Keywords: child, labour, attendance, market, adult

1.0 INTRODUCTION

Market structure has been one of the basic principles of microeconomics in respect to activities of demand and supply. In rural context, market structure depends on the number of interplay in the system not necessarily based on its types. The structures of rural markets are traditionally based on greater benefits to the rural poor (Gupta & Jain, 2016; Park, 1981; Van der Ploeg *et al.*, 2015). Most of these markets are periodic in nature and are located on the suburb or interior of rural areas; they are characterized by lower prices of commodity, access to choice, and cheap labour supply (Hay & Smith, 1980; Maheshkar & Jain, 2013; Wanmali, 1980). The labour supply in rural context is dominated by both the activities of adult and children. Sometimes, insufficiency in adult labour supply induce households to subject their children to work, in which the net return is used to complement the household income (Becker *et al.*, 1990; De Brauw, 2015; Maconachie & Hilson, 2016). The supply of child labour is usually cheaper when compared to adult labour, as they normally engage in various economic tasks, mainly household goods and working for wage (Fafchamps & Wahba, 2006; Jacoby & Skoufias, 1997; Poddar & Chaudhuri, 2016). This labour participation serves as gain to both the households and those

children who partake in the activities as the earnings generated are used to cater for extra needs, or compliment household income when the household income is below subsistence level. Evidence from Nigeria shows that about 15 million children are engaged in labour, with 64% of them as street vendors; while 17.4% and 82.6% of them are in urban and rural areas respectively (ILO, 2002; UNICEF, 2006). The rural child labourers are committed to labour supply, because their supply of labour only depends on fixed days as the rural areas virtually operate a periodic market. These children try to maximize their time and earnings particularly on the market days, which usually lead to their absenteeism in schools. This in turn affects their performance, and the dropout rate continues to rise at a high level, while others tend to shorten their educational career at an early age.

In extant literature, earlier discussions on periodic markets are centered on its nature of operation (Wanmali, 1980; Park, 1981; Dokmeci et al., 2006), while recent studies examine its characteristics and the extent of its distribution (Abua *et al.*, 2013; Datonjo *et al.*, 2015; Ehinmowo & Ibitoye 2010; Omole *et al.*, 2013). Although, study conducted by Muhumuza (2012) emphasized on the relationship between access to rural product markets and child labour extent. The role of periodic markets to rural communities cannot be deemphasized; many empirical studies have contributed to its workings. For example, Hay and Smith (1980) discuss how periodic markets contribute to the welfare of rural dwellers; Park (1981) in his study of Korea emphasizes on its changes based on the merchants' visitation pattern over time. McGee (1974) conducted a research in Southeast Asia and found that, hawkers and traditional occupational groups equally determine economic growth of every society. Though, some studies focus on the danger involved in hiring adult labourers, which seems not to be profitable since they always bargain for higher payments (Edmonds & Sharma, 2006; Hatlebakk, 2006; Villanger, 2006). Evidence from Peruvian data found that a short fall in adult wages increased children participation in market (Ray, 2001). Similarly, with intense household economic crisis, participation of children in labour continues to deepen in informal sector, thereby making children to work all day through especially when its periodic market day (Giri, 2007; Kane, 2009; Robson, 2004). Parents send their children to supply labour in order to meet up with their targeted income, which makes labour supply to be inelastic (Humphries, 2013).

Relating periodic market and child labour to school attendance; access to markets makes households engage their children in wage employment, which makes them less likely to attend school (Fafchamps & Wahba, 2006). A specific result obtained from Brazilian case study entails that those who work in the market have worse performance than those who work in the household (Bezerra *et al.*, 2009). Using the same Brazilian case study, an insight into schooling rate found only compliance to periodic clinic visit and schooling to decrease child labour supply (Foguel & Barros, 2010). Although study by Adhvaryu and Nyshadham (2012) examines the effect of health care system to child labour and schooling in Tanzania, and found access to periodic market to be insignificant for children in terms of time allocated to both school and work due to illness; while, Uganda study by Muhumuza (2015) found a significant relationship between periodic markets and hours of child work, as distant to market discourages child engagement in economic activities. Household head characteristics are also responsive for child involvement in periodic market. For instance, in Tanzania being female headed influences child engagement in market activities than the male headed (Akarro & Mtweve, 2011); while

educational level of head indicates a negative effect on the probability of child working for wage in the market and positive influence of child schooling in Veitnam (Dang, 2012).

However, children from rural areas always have a divided attention between labour supply to markets and their demand for schooling, particularly on the market days. Thus, this study did not only concentrate on periodic market and its effects on child labour extent, but also on how it equally affects child academic performance. This is sort for, as the pupils' attendance rate continue to decrease from 71% in 2012 to 69% in 2014 (NBS, 2015). In the light of the above discussion, this study examines the effect of market day on child labour hours participation and academic performance; also to ascertain whether presence of adult affect child labour and school attendance on the market days. This paper is therefore divided into four sections. Aside introduction, section two discusses the method, section three presents the result, and section four concludes the study.

2.0 RURAL MARKET AND LABOUR SUPPLY IN NIGER STATE

Niger state is one of the state in Nigeria with the largest land mass 76,363km². The geographical location is between longitudes 4° 30'E and 7° 20'E and latitudes 8° 11'N and 11° 20'N. The average temperature of the state ranges from 23^{oC} to 37^{oC}, which makes the environment more agricultural inclined with main crops such as cassava, maize, rice, tomatoes and yam. Niger State has the largest land mass in Nigeria, with 76,363km² out of 923,768 km² which is Nigeria total land mass (NBS, 2015). Production of these crops provides opportunity for both the young and the old in land tiling to harvesting and selling of the products. Within the process, various forms of labour are required. The intensity of labour supply is mostly high, especially when the good are supplied to the markets. Various kinds of labour are needed at different stages in facilitating the goods to end users. In the entire West Africa, Niger state is one of the hub for crops like yam and rice. The state is characterized by large rural markets, which are periodic in nature with large volume of sales. The predominant rural markets in the state are Gwada market in Shiroro, Beji market in Bosso; Babanna market in Borgu; Lemu market in Gbako; and Tungan-Mallam in Paikoro. The study emphasizes on Tunga-Mallam local market day which usually operate once within the week day. It constitutes one of the largest dominated rural market in the state aside the other ones that permanently operate during the weekends. Its uniqueness is based on high business turnover recorded all the time. With large volume of trade, some rural dwellers are permanent residents in that community with their children enrolled in the community school. The educational success of these children are often interrupted once it is market day, due to cheap labour supply by children.

3.0 THEORETIC MODEL

Following Basu and Van (1998), and Ravallion and Wodon (2000) luxury axiom and utility model respectively, this study developed a basic model consisting of interrelation between household, child and periodic market in the rural areas. The basic model explains the necessity that leads to demand for child labour in a periodic market, such that the wage charged by adult is twice the wage of a child, given the same level of output. The model assumes that the household income is always below subsistence level in the rural areas, and with the presence of community market, demand and supply for labour is always guaranteed. This can be mathematically presented as

$$H < I \dots\dots\dots 1$$

Where H is the household and I is the income earned by the household. The structure of this Eq. 1 is that, household is earning below the subsistence level. For household head to operate above this subsistence level, they have to substitute their income (y) with other source of income (m) so that the total earnings will be

$$I = y + m \dots\dots\dots 2$$

Where y is the household head income and m is the income obtained from other source, specifically wage payment to adult or child from the market activities. That is

$$m = A + C \dots\dots\dots 3$$

With the presence of market in the community, those household heads earning below subsistence level will utilize the opportunity of the market by supplying labour. Given the two categories of labour available in rural areas (i.e. adult and child), the payment of wage for adult is twice the wage for child¹. The demand for labour will be $Z_{a,c}$ for adult and child market demand.

$$m(w_A) = A \rightarrow \text{for } Z_a = w_a \dots\dots\dots 4$$

While for child,

$$m(w_C) = C + C = 2C \rightarrow \text{for } Z_c = w_c \dots\dots\dots 5$$

Such that, w_c is twice the wage of w_a . Given w_a and w_c to be adult and child wage respectively, the markets will prefer to employ children since the output of both adult labour and child labour are the same thereby keeping their wage payment very low. This therefore necessitate for more demand for children than adult labourers. This high demand causes them to skip school attendance which invariably affects their school performance. Such that child engagement is a function of

$$C = S(l + d) \dots\dots\dots 6$$

Where S refers to schooling, since the concern is for those who school; l is leisure time available for a child and d is the working hours. Those children with Sd have the tendency of skipping school on the market days.

4.0 DATA

The data set² use in this study is obtained from primary source using a structural questionnaire from Paikoro local government; a total of 408 child respondents ages 10 and 14 from 226 households were purposively obtained, a maximum of two children per household head were interviewed in order to avoid biasness.

¹ $C = \frac{A}{2}$, a scenario that differs from the study of Basu *et al.* (2010), where adult and child wage are the same.

² The data obtained is from the 2015 PhD field survey in the rural areas of the state. The Paikoro Local Government equally happened to have a complete and adequate information regarding child and household characteristics.

5.0 EMPERICIAL MODEL

In line with the basic theoretical model expressed in this study, a bivariate probit model and seemingly unrelated bivariate probit model were used to determine the effect of market days and adult presence on child participation in labour and school attendance rate. The dependent variable has child who regularly participate in labour as one, and zero otherwise; school attendance has those with full attendance rate for a period of one month³ as one, and zero otherwise. The independent variables are child participation in labour on market days taking the value of one and zero otherwise; child performance signifying child score in English and Mathematics; presence of adult in the household taking the value of yes as one and zero otherwise; and household income measured by average daily expenditure. Other control variables in the model consist of child age, measured in number of year attain; child gender with one as male and zero otherwise; and child average income generated from market activities per day; gender of household head taking the value of one as male and zero otherwise; and educational background having one as literate and zero otherwise. The bivariate probit model use in this study is expressed as

$$P_r (Cl=1, St=1) = \alpha + \beta_1 X + \mu_i; \dots \dots \dots 6$$

Where X denotes the key variables of market and adult presence. Such that

$$P_r (Cl=1, St=1) = \alpha + \beta_1 m_c + \beta_2 p_r + \beta_3 A + \beta_4 i_h + \mu_i; \dots \dots \dots 7$$

In order to ascertain whether presence of adult affect child labour and school attendance on the market days, an interaction term ($mc*A$) was included by multiplying market participation of child and adult present in a household. Income was excluded to see if children still supply labour to the market in relation to adult presence.

$$P_r (Cl=1, St=1) = \alpha + \beta_1 m_c + \beta_2 p_r + \beta_3 A + \beta_4 mc*A + \mu_i; \dots \dots \dots 8$$

However, the model was expanded by including child and household characteristics to see if any changes might arise from child labour and school attendance. Such that

$$P_r (Cb=1, St=1) = \alpha + \beta_1 m_c + \beta_2 p_r + \beta_3 A + \beta_4 i_h + \sum_{i=1}^m \beta_5 \text{Control} + \mu_i \dots \dots \dots 9$$

Where $\beta_7 = (1, 2, 3, 4 \text{ and } 5)$ and control = (age of a child; gender of a child; child income, gender of head, and education of household head).

³ The study use attendance rate for one term only, schools always operate a minimum of 15weeks and maximum of 18 weeks for one term. The study equally considers other factors such as sickness, ceremonies etc. which necessitate child absenteeism in school.

6.0 RESULT

The result segment consists of both descriptive and inferential result estimated on child labour participation and school attendance.

6.1 Descriptive Result

The result in Table 1 indicates a descriptive statistic for the variables used in the study. The respondents are drawn from the rural areas in Tungan-Mallam and its environs; out of the 408 respondents, 38% respondents didn't participate in any paid labour, but do participated in house chores which are minimal in nature. House chores in many rural areas in the state are considered to be part of norms and values of child up-bringing. The remaining 62% respondents participate in paid labour or equivalent task; these children mostly engage in auto mechanics, market activities and communal farming. The statistics on school attendance rate show 34% of children were having complete class attendance with no history of skipping class. 66% of the children have series of incomplete class attendance, due to child labour supply or other factors other than labour supply. Though, only few children were absent with cogent reasons, which has no correlation with child labour supply. On the market activities, about 75% of the respondents don't fully engage in labour supply on the market day, but rather did partially engage in labour after school hours. About 25% of the children sampled actively participate in labour on market day, these categories of children always forfeit their schooling on the market day, as they always declare that particular day as 'money making day'. These children are seen in market arena as head load carriers, crafts, hawkers, shop keepers etc. Their engagements in most of these activities are with the consent and support of their parents.

Table 1
Descriptive Statistics

Variable	frequency	%	Mean	Sd	se(mean)
<i>Child labour participation</i>					
No	154	38	0.62	0.49	0.02
Yes	254	62			
<i>School attendance</i>					
Complete	139	34	0.66	0.47	0.02
Incomplete	269	66			
<i>Market activities</i>					
Inactive	307	75	0.25	0.43	0.02
Active	101	25			
<i>Performance</i>					
≤49	156	38	51.96	14.04	0.70
≥50	252	62			
<i>Presence of adult</i>					
No	99	24	0.76	0.43	0.02
Yes	309	76			
<i>Household Income</i>					
≤399	109	27	6.07	0.37	0.02
≥400	299	73			
<i>Age of a child</i>					
10	93	23	11.88	1.36	0.07
11	67	16			
12	99	24			
13	92	23			
14	57	14			
<i>Gender of a child</i>					
Female	167	41	0.59	0.49	0.02
Male	241	59			
<i>Gender of household head</i>					
Female	85	21	0.79	0.41	0.02
Male	323	79			
<i>Education of household head</i>					
Illiterate	171	42	0.58	0.49	0.02
Literate	237	58			
<i>N</i>	408	100			

Source: Fieldwork 2015

The performance of these children were equally captured, as 38% of the children performed below average, with some of them having very poor performance; while the remaining 62% of the respondents performed above average by scoring more than 49%. In general, the mean score of their performance is 52% with a standard difference of 14%. The presence of adult in a particular household is equally a determining factor of a child not participating in labour, or participating in labour but to a lesser extent. The key issue emphasize by this study is that even with their presence, some market dwellers prefer to engage children than adult. Thus, 24% of child respondents have no adult in their house, while 76% of child respondents have adults in their homes. In rural areas, the household income entails the economic status of a house, and the need for shock absorbers especially when the head earnings is below subsistence level. 27% respondent heads spend less than ₦400 per day, which is below the poverty line (Idowu, 2013; Oni & Yusuf, 2008), whereas 73% of respondents always spend ₦400 and above in a day. To a large extent, rural economies are still mono-cultural with income differential when compared to urban settings.

Other control variable used in this study is the age of a child ranging from 10 to 14 years of age, those with 10 to 13 years of age were 23% in the sample, children with ages 11 and 14 are represented by 16 and 14 respectively, while the highest being 24% is for children at 12 years of age. With little difference of 1.36 in the sample, it shows that the samples are evenly distributed to some extent. On the child gender, 41% are female, while 59% were male. Equally, gender of household head has female to be 21% and male heads representing 79%. The dominance of male over female is due to the nature of existing demographic difference. Also in term of children, the call for girl child education is still at a slow paste, with some cultures still being skeptical about future endeavor of their female children once they enroll in school, as it will have denied them the culture of early marriage. The education of household heads is paramount to this study, as 42% heads have no history of attending any school, while the 58% were considered literate; this is because the larger percentage of heads once attends elementary schools. The last column in the table denotes the *standard error (SE)* of the mean which is obtained from the statistical distribution of standard deviation.

6.2 Estimation Result

In line with the basic mathematical model expressed in this study, empirical analyses were estimated in order to see the effect of child involvement in market on child labour and school attendance. The result in Table 2 consist of three equations with market participation, adult presence and their interaction as a single equation. Equation 1 entails the significance of market participation by child. Finding shows that access to market significantly increases child participation in labour by 2.44 and decreases their attendance rate by 2.59, especially when it is market day. This is in accordance with the study of Fafchamps and Wahba (2006). In equation 2, adult presence in a household was marked as one if present in a household and zero otherwise. Despite the presence of adult in a household, child participation in labour significantly increases by 1.21 and decreases school attendance by 1.97. this result validate the assumption postulated by this study, as the wage received by child is cheaper than the adult wage. The scenario in this study setting is therefore in contrary with that of Basu *et al.* (2010). Similarly, the result in equation 3 is the interaction terms of adult presence and periodic market. The result shows that even with presence of adult in a household, child participation in labour significantly increase by

2.27 and decrease school attendance by 2.76 at 1%. This is in line with the study of Humphries (2013).

The results in Table 3 show a significant relationship between labour supply to periodic market, child labour activities, and school attendance. It indicates that activities of market day increases child participation in labour by 2.72 and decrease school attendance rate by 3.01. Drastic reductions on children attendance rate in school were always experienced particularly on the market day, due to high demand for labour in the market, because the immediate net return from market is higher than future expected return from schooling. The labour supply to market by children are of two bases, first are those that fully have school attendance even on the market day, but normally supply labour in market after school hour; while the second set are those children that forfeit schooling for the whole day by intensively maximizing their time and net return from labour. The effect of excessive engagement in labour makes children to miss lesson periods. These lesson periods taught in a week are interwoven as the early lessons are always prerequisite for the lessons in the later week; this confirm the finding of Wahba (2006). With market day activities by children, their performance seems to be endangered. This was seen as child labour activities decrease child performance by 3%, whereas, an increase in performance was due to increase in school attendance by 10.49%. This indicates that the level of performance of larger percentage of children depends on their activeness in labour supply. A worst scenario was seen on children that forfeit schooling on the market day, while performance was partial for those that attend school but still supply half day labour on the market day; this is in line with the finding of Bezerra *et al.* (2009).

Table 2
Bivariate Probit Result

<i>Independent Variables</i>	1		2		3	
	Child labour	School attendance	Child labour	School attendance	Child labour	School attendance
Access to market	2.4365*** (0.3882)	-2.5935*** (0.2027)				
Presence of adult			1.2056*** (0.1892)	-1.9683*** (0.1801)		
Access to market*Adult					2.2736*** (0.4088)	-2.7557*** (0.2749)
Wald Chi ²	150.72***		120.95***		107.28***	
N	408		408		408	

Notes: Standard errors are in parentheses, P values: significance ***1%.

Presence of adult in a household was not significant to child labour supply, but significant to school attendance with an increase in attendance by 0.67. To some extent it confirms the basic mathematical model, as the presence entails increase in school attendance. A household with adult that participate in labour supply to the market always experience high rate of net return, such that concentration into labour supply is shifted from the child to the adult, especially if the household head has concern for child education. Also the significance of adult to school attendance might be due to high level of encouragement usually aired by some educated adults;

this does not concur with the finding of Ray (2000). The relationship between household income and child labour is negative and not significant, but positively and significantly related to school attendance. This suggests that any addition in household income increases child school attendance rate by 0.56, if the household income is above the subsistence level. The household level of income being a key determinant of child involvement in both labour and schooling, household with high income mostly have their children participate in school with adequate learning materials; and on the other hand, households with low income have some of their children engage in labour in order to absorb the income shock.

Table 3
Bivariate Probit Result

<i>Independent Variables</i>	4	
	Child labour	School attendance
Access to market	2.7239*** (0.4284)	-3.0051*** (0.4994)
Performance	-0.0300*** (0.0070)	0.1049*** (0.0161)
Presence of adult	0.4147 (0.3179)	0.6712* (0.4067)
Log of income	-0.3161 (0.2156)	0.5635* (0.3400)
Wald Chi ²	157.06***	
N	408	

Notes: Standard errors are in parentheses, P values: significance *10%; ***1%.

To ascertain the effect of market labour and adult, interaction terms is used. The result present in Table 4 shows that presence of market increase child participation in labour by 3.15 and decrease school attendance by 2.36, while performance of children that engage in labour decrease child labour by 0.03 and increase school attendance by 0.11. Absence of adult in a household increase child participation in labour by 0.73, but it does not significantly influence school attendance. When analysing child participation in labour on the market day, absence of adult in a household does increase their labour supply and decrease their school attendance; though that of child labour has no statistical backing.

Table 4
Seemingly unrelated bivariate probit result

<i>Independent Variables</i>	5	
	Child labour	School attendance
Access to market	3.1478*** (0.5938)	-2.3591*** (0.4046)
Performance	-0.0322*** (0.0067)	0.1099*** (0.0123)
Presence of adult	0.7307* (0.3864)	0.4699 (0.5410)
Access to market *Adult	3.0668 (1592.75)	-1.9610*** (0.7316)
Wald Chi ²	150.72***	
N	408	

Notes: Standard errors are in parentheses, P values: significance *10%; **5%; ***1%.

The result in Table 5 shows the effect of other control variables on child labour and school attendance. Control for child age, child gender, household head gender and education of household head; the result for child involvement in the market indicate a significant positive and negative relationship with child labour and school attendance respectively. That is for any market day that comes by, labour supply to the market increase by 2.82 rate, while school attendance rate decreases by 3.25 rate; this means, even after controlling child and household characteristics, child labour participation increases by 0.09, whereas school attendance rate decreases by 0.25.

Table 5
Bivariate Probit Result with Control Variables

<i>Independent Variables</i>	6	
	Child labour	School attendance
Access to market	2.8180*** (0.4753)	-3.2525*** (0.4913)
Child performance	-0.0256*** (0.0071)	0.1090*** (0.0162)
Presence of adult in household	0.3960 (0.3260)	0.6666 (0.4531)
Log of average income	-0.2964 (0.2282)	0.2627 (0.4326)
Age of child	0.0207 (0.0548)	0.0483 (0.0909)
Gender of child	0.0555 (0.1531)	0.3932* (0.2360)
Gender of household head	0.0679 (0.1817)	0.4241** (0.2091)
Education of the head	-0.6458*** (0.1564)	0.3665* (0.2095)
Wald Chi ²	154.86***	
N	408	

Notes: Standard errors are in parentheses, P values: significance *10%; **5%; ***1%.

For child performance in school, increase in performance decreases child participation in labour by 0.03, and the probability of being in school every day increases performance by 0.11. After control variable was introduced, the child labour participation decrease by 0.0044, while school attendance increases performance by 0.0041. However, significant differences were not found in adult presence in a house and household income. Age of a child does not influence child labour participation and school attendance, while gender of a child and that of household head do influence school attendance as the attendance was 0.39 and 0.42 respectively, this is in contrary with the findings obtained by Akaro and Mtweve (2011). Although, an increase in household head education decreases child labour participation by 0.65, whereas increases child schooling by 0.37. This stresses that household head education influence child participation in labour and school attendance.

7.0 CONCLUSION

The conclusion of this study are based on two major determinants namely periodic market activities and presence of adult in a household in relation to child labour participation and performance. The basic mathematical model indicates the significance of market day participation by children, as the income obtained from both adult and child were used to augment household income, especially for those households earning below subsistence level (Basu & Van, 1998; Ravallion & Wodon, 2000). The model emphasized that the demand for child labour is high even with the presence of adult, because the wage charged by adult is twice the earnings of children if all things being equal. With high net of return from labour, children will prefer to skip classes and use their leisure time for labour supply. This intuition was empirically investigated, and the study concludes that earnings from market day activities encourages child participation in labour and reduces school attendance. The presence of adult increases school attendance if adult is found to be passionate about education, but reverse is the case on market days as earnings from labour tend to be high due to demand. However, the result further entails that an increase in child academic performance, decreases child participation in labour and increases school attendance as obtained in the results.

The need for strict attendance should be emphasized especially on market day, while lack of adherence should lead to class (grade) repetition. This should be followed by general awareness to both parents and children on the danger associated with child labour at interval basis. The use of school and local security forces to regulate child involvement in the market should be launched and enforced. Also, since the majority of the household heads are rural peasant farmers. A common board that will protect their interest through adequate pricing should be established, this will uplift their standard above the subsistence level, which will assist in restoring their confidence.

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