OF SOCIAL INVESTMENT AND THE DEVELOPMENT OF BASIC EDUCATION IN NIGERIA- WHAT DOES THE SCHOOL FEEDING PROGRAM OFFER?

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Abstract

Social investment as a complement to social expenditure focuses on specific social needs, specifies its goals and outlines its expected outcome(s). Government around the world have found the need to complement social expenditures with social investment drives in other to achieve some socioeconomic outcomes in the area of health, employment, education and income. In 2016, government of Nigeria adopted the home grown school feeding program which to be implemented in the public primary schools across the country. Amongst others, the main goal of the program is to increase the number of primary school enrolment and retention rates, as well as improve child nutrition. Guided by the social return on investment concept and model, this study sought to examine the relationship between the enrolment and completion rates for male and female public primary school pupils and the expendpenditure on school feeding. A panel dataset of six states from the six geographical regions of Nigeria where the school feeding program has been implemented from 2017 -2021 was developed. We employ the generalized least squares (GLS) for random effects as determined by the Hausman test for analysis. Our major findings is that on the one hand, school feeding has had more significant effect on primary school completion rate for male than female pupils. On the

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other hand, it has had a better significance on female primary school enrolment rate. We therefore recommend periodic evaluation, health incentives for the pupils and economic incentives for the parents.

Keywords: Social investment; Socio-economic development; investment in education; primary school enrolment; primary school completion

1. Introduction

It has been established that improved economic performance may not always result in an improved standard of living for some segments of any economy (Duttagupta et al., 2017; Nolan, Roser & Thewissen, 2016; Rubin & Segal, 2015). This is even more evident where the active segments of the population have been identified as not reflecting the improvements in economic performance (Dynan & Sheiner, 2018). Where economic performance is dwindling or wobbling, identifying critical segments for urgent intervention expected to generate favorable economic outcomes becomes even more important. By this assertion, we can confidently agree that interventions through articulated economic programs based on established social policy will feature in both developed and developing economies (Sadeh et al., 2020).

Cut across the globe, successive governments in different countries have made attempts to provide for the basic needs of families, communities, and the nation at large by designing social policies that identify the needs of the people (Mair et al., 2022; Adesina, 2011; Hall, 2007). It is believed that meeting those needs will foster economic and social development. It was common to read about how much the government was spending on social issues like (the unemployed, the disabled, the widowed, and orphans). That way, the government attempted to solve those issues through universal programs designed as social intervention programs. It was even common for the public to equate greater spending on a given area with the level of government's commitment which they believe will naturally yield results. But for too long, no one was checking what the additional spending translated to in the lives of the majority of the people to determine if the spending was worth it (Midgley, Dahl & Wright, 2017). A critical assessment of such programs, later on, revealed their shortcomings in providing succor to the needy and their inability to provide equality of opportunities for the generality of the people.

In the recent past, governments have adopted the social investment approach which is considered a better option to social spending. In contrast to social spending, social investment involves government funding a program that entails committing resources in the present period with the expectation of a measurable outcome in a

particular area of policy interest in the future (Hemerjick, 2019). The social investment approach has been embraced by governments both in developed and developing economies and even in the private sector as a veritable tool for causing social change. Owing to its acceptability to all tiers and cadres of governments and the private sector, the term social investment has become multi-faceted coming in different versions as it suits the operators. Some of the terms representing social investment in ideology include; impact investment, social impact investment, social entrepreneurship (Salway et al., 2016). In whichever form social investment is practiced, the mode of operation is similar. However, the focus may be different.

Essentially, social investment is about investing in people for an expected outcome which could be financial or social. Policies are designed to strengthen people's skills and capacities and to also give support to them to be gainfully employed and have a robust social life. Some of the key areas targeted by policymakers include healthcare, education, quality childcare, assistance in the search for jobs, training, and rehabilitation. In contrast to other traditional approaches to government spending, emphasis is laid on the value of outcomes achieved rather than what was delivered and the quality of the delivery.

In 2016, the government of Nigeria launched the National Home Grown School Feeding (NHGSF) program as a social investment program. The program aims to deliver a government –led, cost-effective school feeding program using food that is locally grown by small-holder farmers. The program is expected to bring a two-way benefit as children are fed with nutritionally balanced meals and improved access to school feeding markets is guaranteed for farmers. The community is also expected to benefit from new catering, processing, and food handling jobs. Some of the objectives of the program are; to improve the enrolment of primary school children in Nigeria and reduce the current drop-out rates from primary school which is currently estimated at 30%, and, to address the poor nutrition and health status of many children who have been affected as a result of poverty which has affected the learning outcomes of the children.

Sequel to the implementation of the program, there have been quite some studies attempting to evaluate and assess its outcome based on its stated objectives. Agu et al. (2023) is a cross-sectional study among 24 headmasters and headmistresses of primary schools on the implementation and policy benefits of a national homegrown school feeding program in Enugu, South-East Nigeria. Participants believed that the objectives of the school feeding program which include increased school enrollment, attendance, and enhanced participatory learning outcomes are being achieved. In

addition, specifically, they submitted that school feeding program has improved educational outcomes by increasing learner's years in school especially for young girls. They went further to establish that every additional year of education for a girl results in a 5 – 10% reduction in her offspring's mortality. Conversely, the under-five mortality rate has been established as one of the major factors affecting the primary school enrollment rate in most developing countries including Nigeria (Ly Le, 2015).

Adepoju and Johnson (2021) assessed the nutritional and educational performance outcome of the school feeding program for children in Ilaro, Ogun State, Nigeria. Employing a sample of 250 students systematically selected from 3 public primary schools in the study area, the study has findings that show a high prevalence of stunting, wasting, and underweight children. The result suggests that the school feeding program failed to achieve the child nutrition objective according to the World Health Organization (WHO) standard.

Onah and Onah (2021) assessed the school feeding program in Enugu State using the key informant interview technique. The findings of this study reveal that although the increase in enrollment objective has been achieved, improvement in child nutrition objective is far from being achieved due to irregular feedings and low budget allocation per meal.

Apart from nutrition, some other multivariate factors have been identified as significantly determining the rate of primary school enrollment and retention. They are; demand for child labor, cost of schooling, and safety concerns (Dheressa 2011). Dewey and Borish (2015) established that health, income, family, and gender status, are factors that determine primary school enrollment and retention rate.

These studies point to the fact that the school feeding program may not be the panacea for primary school enrollment, retention, and child nutrition issues. School feeding can only work when it is complemented by the provision of primary health care, stable income for parents, and non-discrimination against the girl-child. Therefore, this study seeks to examine the relationship between male and female primary school enrollment and completion rate, and, under-five mortality rate, income of the middle to lowest quintile of the population, and the amount invested in school feeding in states where the school feeding program has been implemented. The aim is to contribute to the social development and economic growth literature.

The rest of this paper is sectioned as follows: Section 2, Methodology, Section 3, Results, and Discussion of Findings while Section 4 concludes the work.

2. Literature Review

Conceptually, the term social investment itself derives from the concept of 'investment approach'. Under the investment approach, funding is made available based on; (a) the collection of quantitative data on the issue or challenge (b) the possibility of getting the desired solution from the proposed intervention (c) the process of measuring and reporting back to policymakers on the efficiency of interventions in terms of measured outcomes. Therefore, the term social investment relates to the application of the investment approach to the social sector. Part of the mechanisms adopted for impact assessment in social investment is the social investment process. This outlines the different stages that spell the line of action to be adopted by policymakers and the result expected from their actions. The social investment process is depicted in Figure 1 below.
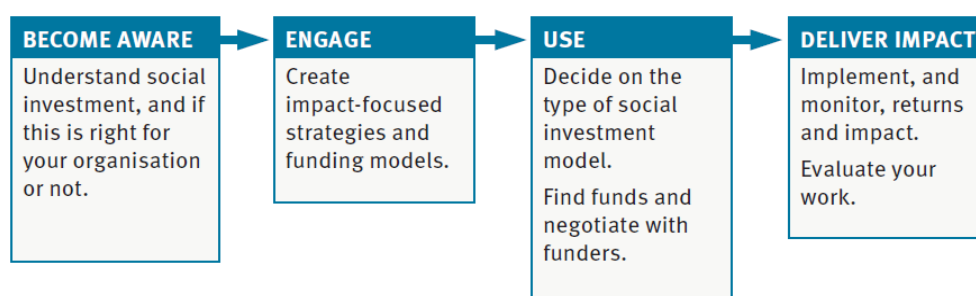
BECOME AWARE	ENGAGE	USE	DELIVER IMPACT
Understand social investment, and if this is right for your organisation or not.	Create impact-focused strategies and funding models.	Decide on the type of social investment model. Find funds and negotiate with funders.	Implement, and monitor, returns and impact. Evaluate your work.

Figure 1. The Social Investment Process

Source: ADAPTED from Salway et al. (2016)

Social investment approach has a process of first segmenting the population to identify groups and individuals with specific needs. This is done using some established administrative mechanisms through which data are collected. Second, innovative interventions are designed specifically for the identified groups. This will usually come with a succinct expectation about the returns or outcomes desired from the intervention and benchmarks for measuring those outcomes. Third, provision of structure for governance and administration in the management of the demand and supply side as depicted by the target groups and the intervention provided. This is illustrated in figure 2 below;

Figure 2. A Social Impact Investment Market Framework

Source: ADAPTED from OECD (2015c)

Outcomes and impact monitoring and assessment are important to check the implementation of strategies and achievement of social investment objectives. These may include measuring both social and financial return on the investment and may be part of the conditions for continued support from the providers of funds. For social investment, success is said to be achieved when there is tangible positive social or environmental change (Mistra, 2023). The positive change anticipated is what is called social impact of the investment and the associated outcome this brings to the beneficiaries. The objective of monitoring and ultimately evaluating a social investment program is to; (a) determine if the investment is generating the desired social return and or financial return (b) analyze its effectiveness in the use of social capital. This is depicted in figure 3.
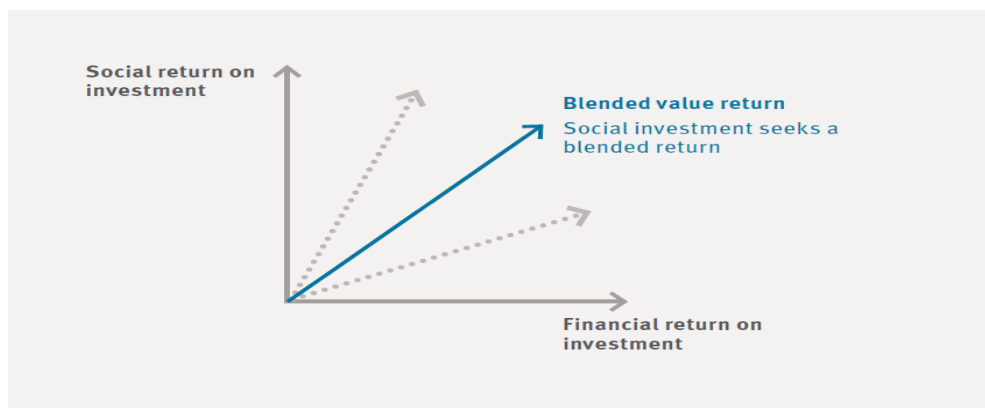

Figure 3. Measuring Social Investment

Source: ADAPTED from Salway et al. (2016)

The theoretical perspectives on social investment cut across both the normative and the formative backgrounds. In the normative literature, social investment is said to offer a viable alternative to what are perceived to be the drawbacks of the traditional 'welfare state'. The argument that the welfare state has raised standards of living by meeting consumption needs through direct cash transfers and social services falters in the face of new economic and political realities (Orkin, 2020; Midgley et al., 2017). In light of this, Gupta (2022); and Gilbert (2005) argue that the state should function as an enabler rather than as a provider of welfare services. Furthermore, there is a need to adopt a more dynamic approach that invests in people's capabilities to enable them to participate fully in the productive economy. Stefaner and Baur (2023); UNESCO/ ILO (2018); and Giddens (2000) propose a new social investment state where governments would prioritize education and skill development which would prepare people to participate actively in the productive economy rather than depend on social benefits.

Therefore, policies that promote social investments and those that perpetuate consumption should be identified and separated. Postain-Azik and Strier, (2020); Morel et al. (2012) shed more light on this separation by showing that social investments promote labour market participation and prepare people for employment, while consumption-based welfare is concerned with income transfers, social services, and de-commodification.

Bandelj and Spielgel (2022), Campbell-Barr and Nygard, (2014), and Esping-Anderson et al (2002) were more specific in their argument for a new welfare state by asking for a social policy that focuses on 'child-centered' human capital investments, affordable daycare, family leave, and other employment-focused policies. The only danger foreseen in this paradigm shift as concluded by some scholars (Cantillon, 2014; Cantillon and Van Lancker, 2013) is that as governments shift their spending priorities from meeting social needs to investing in education, job training, and employment activation, it foretells doom for those who are unable to participate in the productive economy.

The formative literature on social investment (Packard-Winkler et al., 2022; Midgley, 2018; Cassanovas & Ventresca, 2016; Kuitto, 2016) is not as popular as the normative simply because it takes an approach that is purely capitalist talking about how more savings can be generated to finance investment. Like in the normative, the traditional consumption-based welfare system is criticized while they argue for a system whereby asset acquisition/capital accumulation is encouraged. This can be achieved by promoting savings through an individual development account (IDA)

which is directly matched with investments. This background may not be attractive to many governments, especially the developing economies that are still battling with low income.

After the Second World War, social investment ideas have played an important role in development studies and social development for many years (Midgley et al., 2017). Scholars working in these fields have speculated on how governments of modern economies (especially the newly independent countries) could raise the standard of living of their predominantly rural populations. Together with the aid of the World Bank, it was agreed that the key to prosperity lay in industrialization. This in their opinion would transfer labor from the agricultural subsistence sector into modern wage employment, with better income opportunities and an upward trend in growth.

Many governments have embraced this approach mobilizing investments for industrial development through international aid and borrowing as well as domestic capital. The aftermath of this was the creation of national community development programs which established village-level agricultural and crafts projects, clinics, community centers, adult literacy projects as well as schools. Another major initiative from the development economists was that social spending should not be viewed as promoting consumption but as contributing positively to economic development. Therefore, it was argued that national plans must integrate economic and social objectives through a unified socio-economic planning (Midgley, 2017). This particular initiative has helped to sharpen the development thinking of the United Nations which has also urged member nations to look beyond industrial investments to social investment through social programs.

The adoption of social investment ideas in developing economies gives credence to the belief that the people who are healthy, well-fed, and knowledgeable will be more available to contribute to economic development than those who are malnourished, impoverished, poorly educated, and afflicted. The new emphasis on social investment has been supported by the philosophy that government activities and other non-profits should operate as social enterprises. That way, they not only utilize business methods but also generate income from their services and other funding services (Kerlin, 2014; Nyssens et al., 2006). Social investment policies when properly implemented can address the market failures that keep the private sector from investing in social sectors. On the other hand, when not properly implemented, social investment can distort markets and prop up unsustainable businesses (Sunderland, 2016). Some of the notable social impact investor categories in developing countries include; foundations, high-networth individuals, early-stage

venture funds, private equity funds, development finance institutions, other institutional investors, and the Government (OECD, 2016).

Empirical evidence from studies on some developing economies concerning the impact assessment of social investments presents some interesting results. Mwavula (2014) investigated the effect of school feeding programs on pupils in public primary schools in Kenya. The study established that school feeding programs influenced enrollment, attendance, and participation of pupils in the area sampled. In Ghana, Yendaw and Dayour (2015) studied the effect of the national school feeding program on primary school pupils. They concluded that the school feeding program has contributed significantly to pupils' enrollment, attendance, and retention compared to the period before the program's implementation. Another study on the achievement of school feeding in Jasikan District in Ghana (Lagbo, 2012) reveals that the school feeding program has increased the enrollment, participation, and learning achievements in a rural and an urban primary school within the locale.

Mastert (2021) a study on the impact of school feeding programs on the education and health outcomes of children in South Africa has findings that show that there are positive and significant effects on improving illness, school attendance and academic achievement. In addition, it is also observed, that school feeding program has a higher impact in rural regions than in urban settings, larger in boys than in girls.

As much as evidence abound on the effectiveness and positive impact of the school feeding program, some scholars have pointed out some limitations of the school feeding program while highlighting some other important factors that account for the enrollment and retention of primary school pupils. Dheressa (2011) studied the impact of school feeding programs on school participation in the Dara Woreda, Sidama Zone of Southern Ethiopia. The study found no significant positive impact of the school feeding program on any of the three school participation indicators (i.e. enrolment, attendance, and drop-out). The study went further to reveal the multivariate factors affecting school enrollment which are; demand for child labor, cost of schooling, availability of food incentives (school feeding), and safety concerns.

In the same vein, the multivariate factors affecting class attendance were found to include; illness, work for money/food, domestic work, school hour hunger, and long distance to school. Dheressa (2011) further established that even among the beneficiaries, the older the household head is the less likely that the children get enrolled in school during their primary school ages or may not properly attend class

179

even if enrolled. Whereas, absence from classes decreases in both beneficiary and non-beneficiary households when household head education level and household head income are higher. However, it is found that neither household head education nor household income has a significant effect on student dropout in beneficiary households. King, Dewey, and Borish (2015) corroborated the argument above in their study of the determinants of primary school non-enrollment and absenteeism. Their result shows that malaria, menstruation, and lack of money were among the most notable determinants of primary school drop-out and absenteeism. Interestingly too, these factors disproportionately impacted orphans and female students.

3. Data and Method

3.1. Data Collection and Operationalization of Variables

As of December 2022, there are twenty-six states across the six geopolitical zones of Nigeria where the school feeding program has been implemented. For analysis, a state is selected from each of the six geo-political zones. The selection is purposively done to include only states where the school feeding has been operational since the beginning of the program. Thus, a panel dataset comprising of six (6) states are collected and analyzed. We collect separate data for gross male and female enrolment rate, gross male and female completion rate, after the school feeding program (2017-2021). The panel data for (2017 – 2021) will also include the expenditure on school feeding program for all the selected states. The data covers only the public primary schools. This is because school feeding does not extend to private primary schools.

In addition, we consider data suitable to analyze some of the pertinent issues found in the extant literature that could affect enrollment and completion. In this regard, we collect data on income for the household population from the middle to the lowest income quintile (proxied by the wealth index quintile) for each of the selected states. The wealth index is an indicator of wealth consistent with household expenditure and income measures (Rustein, 1999). It has been variously used in country-level surveys to indicate inequalities in household characteristics with regards to the use of health services as well as health outcomes (Rustein et al., 2000). The concentration on the middle to the lowest income quintile household is based on the findings of Caillods et al. (2006), Shay et al (2022) which establish that a larger percentage of pupils in public primary schools are from the middle to the lowest

income quintile households. We also collect data on the under-five mortality rate for each selected state.

Data on all these variables are collected from the Digest of Basic Education Statistics of the Universal Basic Education Commission (2016-2017, 2018 and 2020-2021), Nigeria Multifactor Cluster Survey Report (2016, 2019, and 2021), Social Statistics in Nigeria (2020), and the Nigeria Demographic and Health Survey (2018, 2021) respectively.

3.2. Modelling and Estimation Techniques

Our analysis is based on the social return on investment model (SROI) developed by REDF (1996). It is a popular social impact assessment method comparable to the conventional industry standard for project or organizational level assessment (Farr & Cressey 2019). The SROI method harmonizes social and monetary values for evaluation of social investments in a non-profit sector. The reason it is sometimes referred to as a 'Pseudo-financial parameter'(Keemela 2016). Within the SROI process, the SROI ratio is calculated as the relationship between the monetized benefits and investments, and the analysis is performed on a specific program that needs to be evaluated ex-ante or ex-post (Fairel et al. 2022). The formula for SROI is given as;

$$\frac{\text{Net present value of outcomes}}{\text{Net present value of investment}}$$

We adapt the SROI into a baseline regression model following Ahn & Kim (2014); Bakker & Van Vhet (2019). In this, we replace economic performance with female and male primary school enrollment and completion rates as dependent variables. For the major independent variable representing social investment, we use the expenditure on school feeding for each state. Consequently, a panel regression model of the following form is specified;

$$MSER_{it} = \beta_0 + \beta_1 Q1_{it} + \beta_2 Q2_{it} + \beta_3 Q3_{it} + \beta_4 U5MR_{it} + \beta_5 ExpFed + \varepsilon_{it} \,...(1)$$

$$FSER_{it} = \beta_0 + \beta_1 Q1_{it} + \beta_2 Q2_{it} + \beta_3 Q3_{it} + \beta_4 U5MR_{it} + \beta_5 ExpFed + \varepsilon_{it} \,....(2)$$

$$MSCR_{it} = \beta_0 + \beta_1 Q1_{it} + \beta_2 Q2_{it} + \beta_3 Q3_{it} + \beta_4 U5MR_{it} + \beta_5 ExpFed + \varepsilon_{it} \,...(3)$$

$$FSCR_{it} = \beta_0 + \beta_1 Q1_{it} + \beta_2 Q2_{it} + \beta_3 Q3_{it} + \beta_4 U5MR_{it} + \beta_5 ExpFed + \varepsilon_{it} \,...(4)$$

Where MSER is male primary school enrollment rate, FSER is female primary school enrollment rate, MSCR is male primary school completion rate, and, FSCR is, female primary school completion rate. UFMR is under-five mortality rate. ExpFed is expenditure on school feeding program. The ith term represents each of the number of states in the pool, i.e, i = 1,2,3,…n. While, t represents the time period covered, i.e, t = 1,2, 3…k.

The descriptive analyses is carried out to reveal the distribution and correctness of the data. The Pearson correlation is also carried out to reveal the associative properties of variables. Lastly, we employ the pooled OLS and the panel regression to analyze the effects of variables. This is complemented with the Hausman test to investigate the fixed and random effects that are possible.

4. Results and Discussion of Findings

4.1. Descriptive Analysis

Table 1. Descriptive Statistics for Social Investment Variables

Section 1

Variable	Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum
MSER	30	66.642	30.22779	5.518814	34.51	163.21
FSER	30	63.22033	27.79008	5.073751	32.62	152.63
MPSCR	30	73.82	16.09616	2.938744	43.13	131.51
FPSCR	30	68.50933	16.62098	3.034563	39.2	123.16
Wealth (Q1)	30	20.65667	8.296517	1.51473	1.5	32.4
Wealth (Q2)	30	17.92667	9.911468	1.809578	0.1	30.3
Wealth (Q3)	30	14.61333	13.3738	2.44171	0	38.5
U5MR	30	81.03333	50.39259	9.200385	-64	203
ExpFed	30	374860.5	415684.4	75893.24	90523	1998816

Section 2

Variable	Skewness	Kurtosis
MSER	1.623607	5.277195
FSER	1.660007	5.501877
MPSCR	1.064048	6.9809
FPSCR	0.6827646	5.414148
Wealth (Q1)	-0.9804313	3.352099
Wealth (Q2)	-0.4785122	1.668707
Wealth (Q3)	0.273122	1.537384
U5MR	-0.3297099	4.740375
ExpFed	2.635574	9.814757

The result illustrated in table 1 shows the descriptive statistics of the data for all the variables employed in this study. Except for number of pupils fed, all other variables have data whose standard deviation fall below their mean. Their mean values are also not too far below the median values. This is an indication of stability in the values of the data. The skewness and kurtosis statistic which provide first-hand information about the normality of the series show that the main dependent and independent variables; i.e, MSER, FSER, MSCR, FSCR, Expfed are positively skewed since their respective value is greater than zero. However, wealth quintile 1 & 2, and under-five mortality are negatively skewed. The kurtosis statistic with a threshold of 3 shows that virtually all the variables are leptokurtic (highly peaked) since their values are greater than 3, with the exception of wealth quntile 2 & that are platykurtic. With the assumptions of stability and normality of data established, we go further to analyze their relationship.

4.2. Correlation Analysis

Table 2. Pearson Correlation for Social Investesment Variables

Section 1

Variables	MSER	FSER	MPSCR	FPSCR	Wealth (Q1)	Wealth (Q2)
MSER	1.0000	0.9936	0.1976	0.0670	-0.0893	0.2525
FSER	0.9936	1.0000	0.2284	0.0976	-0.1008	0.2126
MPSCR	0.1976	0.2284	1.0000	0.9270	-0.2904	-0.2965
FPSCR	0.0670	0.0976	0.9270	1.0000	-0.1487	-0.1950
Wealth (Q1)	-0.0893	-0.1008	-0.2904	-0.1487	1.0000	0.4016
Wealth (Q2)	0.2525	0.2126	-0.2965	-0.1950	0.4016	1.0000
Wealth (Q3)	0.1389	0.0933	-0.3142	-0.2553	0.0494	0.8565
U5MR	0.5397	0.5411	-0.2365	-0.2524	0.1732	0.5653
ExpFed	0.4685	0.4623	-0.1522	-0.1382	-0.0589	0.4184

Section 2

Variables	Wealth (Q3)	U5MR	ExpFed
MSER	0.1389	0.5397	0.4685
FSER	0.0933	0.5411	0.4623
MPSCR	-0.3142	-0.2365	-0.1522
FPSCR	-0.2553	-0.2524	-0.1382
Wealth (Q1)	0.0494	0.1732	-0.0589
Wealth (Q2)	0.8565	0.5653	0.4184
Wealth (Q3)	1.0000	0.4702	0.2482
U5MR	0.4702	1.0000	0.6413
ExpFed	0.2482	0.6413	1.0000

Coefficient Alpha

Cronbach's Alpha	0.0003
Standardized Cronbach's Alpha	0.6654

The correlation matrix which provides information about the association between a pair of variables and possible multicollinearity is presented in Table 2. As illustrated, there is a strong positive association between male primary school enrollment and

female primary school enrollment rates post school feeding suggesting muticollinearity. The reason we have separate models for the two. Aside that, both male and female primary school enrollment rates are positively associated with male and female primary school completion rates, wealth quintile 2 & 3, under-five mortality rate as well as expenditure on school feeding. However, male and female enrollment rates are negatively associated with wealth quintile 1.

Male primary school completion rate and female primary school completion rate post school feeding are positively and strongly associated, further giving credence to the separation of the two into different models. However, they are negatively associated with expenditure on school feeding and under-five mortality rate. Under-five mortality is still very much prevalent in Nigeria as observed on data from 2017 to 2019. The figures only started dropping from 2020. As established in Ly Le (2015) high under-five mortality rates in developing countries have a negative association with both female primary and female secondary school enrollment rate. Observing this characteristic for the male and female primary school completion rate in this study we believe, still aligns with the position of Ly Le (2015). Pupils completing primary schools are the ones due for enrollment in secondary schools. The only difference is that this study focused on both male and female primary school pupils.

4.3 Regression Results

Both the pooled regression, and the fixed and random effects with the Hausman test under the general least squares were conducted to analyze the effects of variables. In all the four models, the Hausamn test reveal that the null hypothesis of random effects are significant. Therefore, we accept the random effects results which are also similar to the pooled OLS results.

The regression result illustrated in table 3, represents the male primary school enrollment rate model. Wealth quintile 1 which represents changes in the average income category of the population in each state negatively and significantly at 5% affected male primary school enrollment rate by over 200%!. The implication is that as more people moved to the average income category, fewer children were enrolled in public primary schools. This fact is further established in the correlation analysis which shows a negative association between the average income category, and the enrollment rate for male and female. The same is observed for wealth quintile 3 which is has also affected male primary school enrollment rate negatively and significantly. This category represent the lowest income earners of the population. Although a positive effect is anticipated between the lowest income category and male enrollment in primary school as revealed by the correlation coefficient, extreme

poverty could have prevented them from enrolling their children in school irrespective of the incentives available in such schools. Only the changes in income quintile 2 which is the below average income category positively, however, less significantly at 10% affected male primary school enrollment rate. The main explanatory variable; expenditure on school feeding had a positive, however, not significant effect of less than 1%!. Changes in under-five mortality rate positively at 58% and significantly at 5% affected male primary school enrollment rate. Our findings is consistent with that of Agu et. (2023), eventhough we couldn't establish a peculiar relationship between female enrollment and under-five mortality rate. Our findings on the effect of the various categories of income using the wealth quintile from average to lowest, aligns with the position of Dheressa (2011) where it is established that income level and education of household head affects enrollment and retention in primary schools. Where income and education level is higher, enrollment and retention is higher for both school feeding beneficiaries and non-beneficiaries. Where income level is lower coupled with old age or lack of education of household heads, enrollment and retention is lower for both school feeding beneficiaries and non beneficiaries. This position is supported by Ferguson, Bovaird and Muller (2007) a study conducted in Canada with findings which show that children from low-income families do not receive the stimulation and readiness for school. The study went further to argue for an intervention not just for the children but the entire household in order to make it effective.

Table 3. Random Effects GLS Result for Male Primary School Enrollment Rate Model

Random-effects GLS regression	Number of obs	=	30
Group variable: stateid	Number of groups	=	6

R-sq:	Obs per group:		
within = 0.3316	min =	5	
between = 0.7273	avg =	5.0	
overall = 0.4747	max =	5	

	Wald chi2(5)	=	21.68
corr(u_i, X) = 0 (assumed)	Prob > chi2	=	0.0006

mser	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
wealthq1	-2.332264	.9629428	-2.42	0.015	-4.219597	-.4449308
wealthq2	3.13697	1.617879	1.94	0.053	-.0340151	6.307954
wealthq3	-2.234984	1.02909	-2.17	0.030	-4.251963	-.2180054
u5mr	.5838261	.1922332	3.04	0.002	.207056	.9605963

Expfed	.0000229	.0000201	-1.14	0.255	-.0000624	.0000165
_cons	49.45871	14.34848	3.45	0.001	21.3362	77.58122

sigma_u	0
sigma_e	20.284038
rho	0 (fraction of variance due to u_i)

In table 4 where the female primary school enrollment rate model is presented, it is observed that all variables have similar effects as is observed in male enrollement model. The main variable; expenditure on school feeding had a positive effect of less than 1% on female primary school enrollment rate. Although, still not significant, it can be observed that the its probability value of 0.177 which tends towards 10% level of significance, is better than the 0.255 observed for male.

Table 4. Random Effects GLS Result for Female Primary School Enrollment Rate Model

Random-effects GLS regression	Number of obs	=	30
Group variable: stateid	Number of groups =		6

R-sq:	Obs per group:	
within = 0.3395	min =	5
between = 0.8161	avg =	5.0
overall = 0.5067	max =	5

	Wald chi2(5)	=	24.66
corr(u_i, X) = 0 (assumed)	Prob > chi2	=	0.0002

fser	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
wealthq1	-2.273414	.8578281	-2.65	0.008	-3.954726	-.5921018
wealthq2	2.989033	1.441272	2.07	0.038	.1641923	5.813873
wealthq3	-2.248713	.9167544	-2.45	0.014	-4.045518	-.4519073
u5mr	.5808908	.1712491	3.39	0.001	.2452488	.9165328
Expfed	.0000242	.0000179	-1.35	0.177	-.0000594	.0000109
_cons	48.41675	12.7822	3.79	0.000	23.36409	73.46941

sigma_u	0
sigma_e	18.656757
rho	0 (fraction of variance due to u_i)

The result in table 5 shows the random effects of all the variables on male primary school completion rate for all the sample states studied. Income quintile 1 and 3 maintained their negative and significant effects on male primary school completion rates. The same way these two prevented enrollment, they can also reduce completion rates. As more people move to the average income category, they may withdraw their children or wards already registered in public primary school irrespective of the incentives available in such schools. In the same vein, as more people fall in the lowest income category, their children or wards may be withdrawn from school. Income quintile 2 maintained a positive and significant effect on male completion rate. Implying that people in this category, majorly, are the ones who enrolled and allowed their children or wards complete their education in public primary schools within the period of study. Quite impressive is the fact that the expenditure on school feeding, positively at less than 1%, however, significantly at 10% affected the male completion rate. Under-five mortality has no significant effect on male completion rate.

Table 6 illustrates the female primary school completion rate model. It is observed that the income quintiles 1-3 maintained similar effects as observed in male completion rate model. Under-five mortality rate has no significant effect on female primary school completion rate. Worthy of note is the fact that expenditure on school feeding, positively, however, insignificantly affected female primary school completion rate. The implication is that the school feeding program, may have recorded marginal success in female enrollment, however, it couldn't succeed in making a significant contribution to female primary school completion within the period of study.

Our findings is consistent with the findings of Anaero (2020), a study which compared the pupil's completion rate before and during the 2006/2007 school feeding program in selected public primary school in Rivers State Nigeria. The study established that more males completed primary education than females during the school feeding program. Mastert (2021) also has findings from South Africa which shows that boys benefit from school feeding than girls. This position is contrary to the findings of Agu et al. 2023 that school feeding has the capacity to retain young girls especially in school. Whereas, that is possible at a local level, on a larger scale, we couldn't establish that fact.

As observed in Onah and Onah (2021), Adepoju and Johnson (2021) where the efficacy of school feeding in enhancing primary school enrollment but falling short in child nutrition has been established, the insignificant effect of school feeding on

female primary school completion rate may not be unconnected to the issue of nutrition. In addition, other multivariate factors such as; domestic work (Dheressa 2011), menstration and lack of money (King et al. 2015), gender status and income (Dewey and Borish (2015) may have also contributed to female absenteeism and drop out even with school feeding.

Table 5. Random Effects GLS Result for Male Primary School Completion Rate Model

Random-effects GLS regression				Number of obs	=	30	
Group variable: stateid				Number of groups =		6	

R-sq:		Obs per group:				
within = 0.0399			min =	5		
between = 0.9682			avg =	5.0		
overall = 0.3176			max =	5		

		Wald chi2(5)	=	11.17	
corr(u_i, X) = 0 (assumed)		Prob > chi2	=	0.0481	

mpscr	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
wealthq1	-1.59612	.5844055	-2.73	0.006	-2.741534	-.450706
wealthq2	2.063226	.9818833	2.10	0.036	.1387705	3.987682
wealthq3	-1.602381	.6245497	-2.57	0.010	-2.826476	-.3782865
u5mr	.0992553	.1166654	0.85	0.395	-.1294048	.3279153
Expfed	.0000225	.0000122	-1.84	0.066	-.0000465	1.46e-06
_cons	93.08727	8.708028	10.69	0.000	76.01985	110.1547
sigma_u	0					
sigma_e	11.399435					
rho	0	(fraction of variance due to u_i)				

Table 6. Random Effects GLS for Female Primary School Completion Rate Model

Random-effects GLS regression	Number of obs	=	30
Group variable: stateid	Number of groups	=	6

R-sq:	Obs per group:		
within = 0.0397	min =	5	
between = 0.9221	avg =	5.0	
overall = 0.2100	max =	5	

	Wald chi2(5)	=	6.38
corr(u_i, X) = 0 (assumed)	Prob > chi2	=	0.2709

fpscr	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
wealthq1	-1.29109	.6492905	-1.99	0.047	-2.563676	-.018504
wealthq2	2.057153	1.090899	1.89	0.059	-.0809701	4.195276
wealthq3	-1.519296	.6938918	-2.19	0.029	-2.879299	-.1592931
u5mr	.0651233	.1296185	0.50	0.615	-.1889242	.3191709
Expfed	.00002	.0000136	-1.47	0.141	-.0000466	6.63e-06
_cons	82.37522	9.674857	8.51	0.000	63.41285	101.3376
sigma_u	0					
sigma_e	13.719681					
rho	0	(fraction of variance due to u_i)				

5. Conclusion

The study aimed at assessing the contribution of the school feeding program to the development of basic education at the primary school level in Nigeria. Specifically, the objective is to analyze the relationship between male and female enrollment and completion rate in public primary schools, and the expenditure on school feeding complemented by some other explanatory variables, i.e under-five mortality rate, income quintiles 1-3. From the results analysed, interpreted and discussed, we make the following conclusions which also informs our recommendations.

School feeding has had more significant effect on primary school completion rate for male than female. By a very minute margin, school feeding has had a better significance on female primary school enrollment rate than male. Generally, school feeding has not had a substantial effect on the enrollment and completion rate of both male and female pupils.

For both male and female, under-five mortality rate only has significant effect on enrollment rate. It has no significant effect on completion rates. Changes in under-five mortality rates affects both male and female primary school enrollment equally.

Household/individual income other than number of pupils fed has exerted a greater influence on both male and female primary schooll enrollment and completion rates within the period of study. Majority of the pupils who enrolled and completed their primary school education within the period of study are from the below average but above the lowest income backgrounds.

Arsing from the conclusions above, we make the following recommendations.

If the Nigerian government must continue with the school feeding program, emphasis must be placed on periodic evaluations which should take place often. This will help to identify areas where there are shortcomings or issues that are working contrary to the success of the program.

Aside shool feeding, other health incentives targeted at the female child can be introduced in public primary schools. These can include sanitary wares periodic distribution, clean toilet and first aid facilities. These should be done with a view to increase the female primary school completion rate.

Other social intervention programmes for the adult like N-power, cash transfer, household support should be viogorously pursued in other to complement the school feeding program. it has been established in this study like in other previous studies, that household/family income plays a major role in the enrollment and completion rate of public primary school pupils.

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