Open access • Journal Article • DOI:10.2139/SSRN.2273138

The impacts of the food, fuel and financial crises on households in Nigeria A retrospective approach for research enquiry — Source link

Blessing Chiripanhura, Miguel Niño-Zarazúa

Institutions: Polytechnic of Namibia, World Institute for Development Economics Research

Published on: 29 May 2013 - Social Science Research Network (UNU-WIDER)

Topics: Poverty trap, Child labour, Financial crisis and Poverty

UNITED NATIONS UNIVERSITY
UNU-WIDER
World Institute for Development Economics Research

WIDER Working Paper No. 2013/058

The impacts of the food, fuel and financial crises on households in Nigeria

A retrospective approach for research enquiry

Blessing M. Chiripanhura[1] and Miguel Niño-Zarazúa[2]

May 2013

Abstract

This paper examines the impacts of the financial, food and fuel crises on the livelihoods of low-income households Nigeria. It uses primary household level data from Nigeria to analyse the impacts of induced price variability on household welfare. Our results indicate that aggregate shocks have significant adverse effects on household consumption, human capital, and labour decisions with a degree of impact variability between northern and southern regions of the country. We find that the coping strategies adopted by the poor to deal with the short-term effects of the crises, and which include substitution for lower quality food, increasing the intensity of work, withdrawing children from school – especially girls – and engaging children in child labour, can lock households in a low-income equilibrium or poverty trap. Provided that covariate shocks exacerbate these effects, tackling the effects of covariate risks becomes central for present and future development policy.

Keywords: food, fuel, financial crisis, poverty, vulnerability, sub-Saharan Africa, Nigeria
JEL classification: I2; I3, O1, O5

[1]Institute for Capacity Development, Windhoek, [2]UNU-WIDER; corresponding author email: miguel@wider.unu.edu

This working paper has been prepared within the UNU-WIDER project 'New Directions in Development Economics'.
UNU-WIDER gratefully acknowledges the financial contributions to the research programme from the governments of Denmark, Finland, Sweden, and the United Kingdom.
ISSN 1798-7237 ISBN 978-92-9230-635-9

Acknowledgements

We thank Shalini Bahuguna, Maryam Abdu, Massimiliano Calì, Fiona Samuels, Maja Gavrilovic, Caroline Harper and participants of the 2013 CSAE conference at Oxford University for valuable comments on earlier versions of the paper. The data used in this paper was collected as part of a major study commissioned by UNICEF, with the objective of understanding the impact of the financial, food and fuel crises in Nigeria. The views presented in this paper are those of the authors and do not necessarily represent the views or policies of UNICEF.

UNU World Institute for Development Economics Research (UNU-WIDER)
Katajanokanlaituri 6 B, 00160 Helsinki, Finland

Typescript prepared by Lisa Winkler at UNU-WIDER.

1 Introduction

Global and regional crises arising from the collapse of financial institutions, downturns in stock markets, and high levels of food and fuel price variability have become the focus of research and policy debate that seeks to identify the sources and impacts of such covariate events. More recently, the 2008 financial crisis, coupled with food and fuel price increases, were the source of great concern among the development community given their potential effects on poverty and well-being. Recent World Bank estimates suggest the 2008 financial crisis alone pushed nearly 53 million people into poverty in 2009, and given the slowdown in economic growth in several developing economies, the cumulative poverty impacts were expected to rise even further, to an extra 73 million people worldwide (Chen and Ravallion 2009).

The various forms of coping strategies that households resort to deal with crises can have long-lasting and devastating effects on present and future well-being, particularly among vulnerable groups. For example, when children are withdrawn from school, sent to work, or suffer early life malnutrition, they are likely to suffer from long-term (often lifetime) poverty (Hulme and Shepherd 2003; Baulch and Maset 2003). To the extent that covariate shocks exacerbate these vulnerabilities, a better understanding of crises becomes critical to design effective policy responses to address these episodes.

This paper contributes to the existing literature in two important respects: first, it examines the impact of the food, fuel and financial crises on household livelihoods and living standards in Nigeria. The study of these crises has remained largely under-analysed in the country due in part to the dearth and poor quality of existing data. To overcome this constraint, we employ household level survey data explicitly collected in the states of Kano and Lagos to unravel the extent to which households were affected by, and how they responded to, the crises. Second, the paper pays particular attention to the effect of crises on vulnerable groups, notably women and children.

We focus on Nigeria for at least two important reasons: first, the country provides a good point of departure for the examination of the impact of aggregate shocks on resource-rich and commodity-oriented economies in the Sub-Saharan Africa (SSA) region. Second, despite having experienced rapid economic growth over the past decade, and being the second largest economy in the region, Nigeria remains highly underdeveloped in its institutional and economic structures. More than 63 per cent of its population lives on less than US$1.25 a day, with agriculture contributing up to 45 per cent of GDP and employing nearly 90 per cent of the rural population (DfiD 2012).

Overall, our results indicate that aggregate shocks have significant adverse effects on household consumption, asset accumulation and poverty status with a degree of variability in the effects and coping mechanisms between rural and urban settings and northern and southern areas of the country. In particular, we identify strategies adopted by vulnerable households to cope with food price variability. Of particular concern is households' reduction in food consumption, especially among mothers and children; increased working hours to compensate for the income lost through price increases; the withdrawal of children from school; and the increasing incidence of

child labour. Although these strategies are generally short-term, they often have long-term implications for household welfare.

The remaining of the paper is organised as follows: Section 2 provides an overview of recent crises with especial focus on SSA and more specifically, Nigeria. Section 3 describes the primary data used in the analysis. Section 4 presents the analytical approach and estimation strategy adopted to assess the effects of the crises whereas Section 5 discusses the overall findings with regard to coping strategies, notably cuts in food consumption, school dropouts, child labour and employment decisions. Finally, Section 6 concludes with reflections on the policy implications of the findings.

2 Overview of the crises

The *food crisis* came as a result of increases in the domestic and international prices of staple foods. The average world wheat price increased from US$126 per metric tonne (MT) in 2005/06 to US$249 per MT in 2008/09,[1] and declined thereafter before increasing again in 2010/11. The price of maize increased steeply from less than US$150 per MT in 2005, to over US$300 per MT in 2011. This is confirmed by FAO's (2011) report that world food prices were generally stable between 1970 and 2000, but increased significantly from 2006 onwards.

The initial grain price spike in 2008 was caused by a combination of factors, including drought and erratic weather patterns in major grain producing countries like Russia, Australia and Brazil; rising oil prices (oil prices increased by around 200 per cent between 2002 and 2007); and crop diseases across some countries.[2] In addition, the growing demand for bio-fuels resulted in more resources being devoted to that in order to meet the growing demand for green energy, but at the expense of food production. This substitution effect was first observed as far back as the 1980s (Barnard 1983) and von Urff (2007) provided a detailed analysis of the resource trade-off between food and bio-fuel production. Chen et al. (2011) also analyse the adverse impact of bio-fuels on food production. However, it is important to note that although there may be (positive) correlation between fuel and food prices, and that fuel price changes may induce short-run price increases, the pass-through rate and impacts are low in labour-intensive agricultural systems, such as the Nigerian. Given that the pass-through rate to fertiliser and other agricultural input prices is high (Baffes 2007), the low usage of fertilisers and agricultural chemicals in many SSAn countries implies low pass-through rates and impacts.

Many developing countries that rely on fuel imports also had food deficits, making them very vulnerable to *fuel crisis* (Senauer 2008). The fuel crisis was caused by persistent increases in the price of fuel on the international market. The global price of hydrocarbon fuels increased persistently from the beginning of 2002. The price per barrel reached a peak of US$120 in May 2008, from an average of under US$30 before 2003. High energy prices fed into higher production and transport costs in the manufacturing sector, contributing to higher agricultural input prices. Given that on average 10 per cent of household expenditure goes to the purchase of energy (Baker

[1] http://www.ers.usda.gov/data/wheat/YBtable20.asp

[2] http://chartsbin.com/view/oau

2008), rising prices had a significant impact on the overall household purchasing power, especially among poor households. Many countries suffered from the energy crisis because of supply bottlenecks and the growing demand for energy from emerging economies like Brazil, China and India, which contributed to higher prices. At a national level, the crisis was, in some countries, caused by market failures, shortage of foreign currency, and restrictive laws governing operations in the energy sector. Paradoxically, although Nigeria is Africa's biggest oil producer, the country imports more than 80 per cent of its domestic fuel, owing to a lack of refining capacity, which makes the country vulnerable to international fuel price volatility.

While oil-exporting countries such as Nigeria, Libya, Equatorial Guinea and Gabon benefitted from rising international oil prices, fuel-importing countries experienced a deteriorating balance of payments and fiscal positions. The decline in oil prices at the end of 2008 witnessed a partial reversal of fortunes for oil exporters, but some were able to draw down their reserves to smooth expenditures, and this reduced the impact of the volatility on their economies.

The 2008 *financial crisis* was the result of the bursting of the real estate bubble in the USA, which, through the sub-prime mortgage market collapse, spiralled into a global financial market crisis that caused the downfall of major financial institutions and shook the financial foundations of many economies across the world. The crisis was, in part, a moral hazard problem posed by the financial sector,[3] and governments across the world were forced to rescue banks in order to avoid contagion and complete collapse of the sector. The moral hazard background of the financial crisis is akin to that of the Asian financial crisis of the 1990s (Mishkin 1999; Kaminsky and Reinhart 1996; Taylor 2009), but this time in countries that prided themselves for having developed well-functioning regulatory frameworks. Crotty (2008) argues that the crisis was worsened by the new international financial architecture characterised in part by bad to no regulation under the guise of capital market efficiency.

The financial crisis imposed serious financial constraints on firms, leading to lower research and development and employment expenditures (Campello et al. 2009). Although some developing countries in SSA were shielded from the direct effects of the financial crisis by their low international financial integration, they still suffered indirectly because of the intertwining of global food, energy and financial markets. Further, financial inflows in the form of aid and grants, remittances and export earnings dwindled for some countries. The food and energy crises preceded the financial crisis, but the effects became convoluted with serious social and economic consequences across countries. In general, urban households seem to have suffered most from the crises because of their dependence on the cash economy, compared to consumer-producer rural households.

The severity of the combination of crises caused social unrest and food insecurity across countries. Rising prices eroded household incomes, resulting in food riots in thirty countries around the world, including Mozambique, South Africa, Cameroon, Senegal, Côte d'Ivoire and Burkina Faso. In Côte d'Ivoire, food and fuel riots followed a 29 per cent increase in the price of beef and a 42 per cent increase in the price of fuel in March 2008. Taxi drivers in Cameroon rioted following persistent fuel price increases, and households took to the streets demanding the availability of

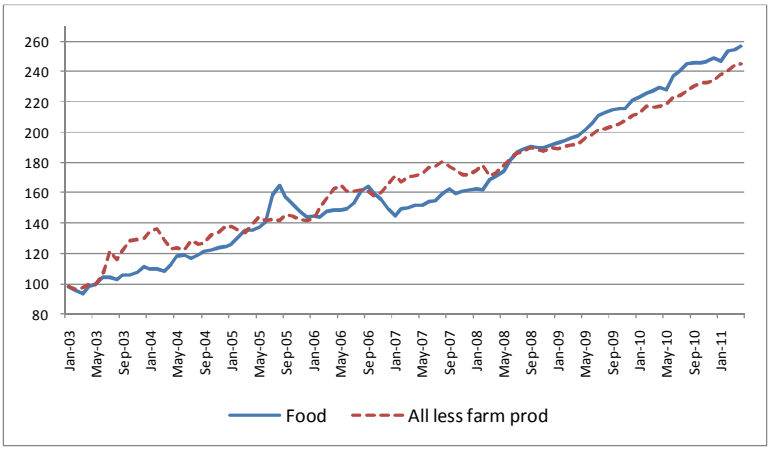
[3] See Goodhart (2008).

affordable staple food. In South Africa, high unemployment and rising cost of living resulted in demonstrations and xenophobic attacks on immigrants whom locals accused of taking away their jobs.

In response, some countries introduced protectionist policies and banned grain exports (e.g. Brazil in 2008; Russia in 2010; South Sudan and Ethiopia 2007). In Kenya, Benin and Senegal, price controls were imposed. On the other hand, other countries liberalised trade by reducing import taxes on food imports (e.g. Nigeria and Morocco). In 2007, Benin reduced import taxes on food products and eliminated the same on others. In general, restrictive trade policies induced greater volatility in markets, fuelling inflation, which was higher in low-income than in middle-income countries. Compared to Latin American economies, there was greater price volatility in SSA (World Bank 2011). The effect was worst in low-income countries where households devote a larger proportion of their expenditure to food (Diao et al. 2010). In Burundi, the cost of high food and fuel prices reached 1.5 per cent of GDP in 2008 (IMF 2008).

For all economies, fuel inflation was, on average, higher than food inflation. In Nigeria, and despite the agrarian structure of the economy, persistent scale and technical inefficiencies in the agriculture sector left the country reliant on food imports and thus exposed to global food price fluctuations (Olomola 2013). Poor households are reported to have reduced the intake of varieties of food like meat, vegetables and rice owing to high prices (IFPRI 2008).

Figure 1: Trends in domestic food and non-food prices in Nigeria, 2003-11



Source: authors' calculations based on data from the National Bureau of Statistics.

Figure 1 presents the trend of food prices in the country between 2003 and 2011. It shows that food prices in Nigeria have a steady long-term upward trend, characterised by short-term variability with pronounced peaks and troughs between mid-2000s and early 2008, which corresponded to the rise and fall of international food staples. Similar to food prices, fuel prices have followed a long-term upward trend, although displaying lower short-term variability than food prices in most states.

This seems to confirm the evidence that food prices tend to be subject to more sudden variance in the short run than fuel prices. From a macro-perspective, this seems to reflect the fact that the Nigerian government has addressed the international fuel price volatility by subsidising the pump price. However, our micro-level analysis shows

that fuel subsidies may actually have had a muted effect on household consumption patterns, especially among the poor, whose access to fuels such as kerosene remains scarce and unpredictable.

The financial crisis was transmitted through several channels, including credit availability, trade, and financial flows including remittances and aid. The main transmission channel for the fuel crisis was observed through changes in oil prices through high demand, especially from India and China. High oil prices meant more revenue in the earlier stages of the crisis, followed by declining international prices and hence revenues from 2009, although by 2010, oil exports had recovered to pre-crisis levels. On the other hand, remittances increased significantly globally from 2000 on, including in Nigeria where by 2007, the remittance to GDP ratio exceeded 5 per cent (World Bank 2011). There was significant growth in this ratio between 2003 and 2007, just before the financial crisis. Interestingly, the crisis did not cause a significant decline in remittances, but rather, just stunted the growth rate. For the households receiving remittances, the adverse effects of food and fuel price increases were partially mitigated.

Another transmission mechanism through which the financial crisis impacted on the economy is reduced aid flows. Although the ratio of aid to GDP shows a positive trend since 2002, there was a notable decline during the peak of the financial crisis. Yet this seems not to have significantly affected the Nigerian economy because it is generally not dependent on aid inflows. More interestingly, credit to the private sector experienced robust growth from 2006 onwards. Also, GDP per capita grew considerably throughout the crisis period. Although the macro level seems to show no significant effects of the crises on the economy, the micro level shows a different picture, especially among the poor and vulnerable. In the following section, we describe the primary data used to investigate the impact of the crises on relevant dimensions of well-being.

3 Data

In early 2011, a household survey (hereafter referred to as the Lagos-Kano household survey, LKHS) was conducted in four deprived local government areas (LGAs) within the two selected states: Ikeja and Amuwo Odofin in Lagos, and Sabongari and Ungogo in Kano state. The selection of the two states, and the corresponding LGAs was based on geographical, economic, socio-political and security criteria aimed at capturing household heterogeneity across states and localities, and with the aim of capturing the effects of the food, fuel and financial crises on vulnerable groups, particularly women and children. Thus, while Kano and Lagos would capture the north-south spatial heterogeneity, Ikeja and Sabongari would reflect the urban context and Amuwo Odofin and Ungogo, the rural environments.

The sampling frame was designed in a way to reduce the problem of exclusion bias from the non-probability sampling process, through random selection of households at the four LGAs, our primary sampling units (PSUs). This process was carried out as follows: first, the enumerators and fieldwork supervisors adopted transect walk methods in each of the selected LGAs in order to ascertain the spread and distribution of population in those localities and redefine the boundaries of LGAs. In the case of rural communities, the team requested permission from the community leaders to

carry out the survey and to get a sense of the estimated number of households in each LGA. Once the geographical boundaries were delimited, the team formed five clusters of 20 households from the cardinal directions: north, south, east, west and centre. The clusters were formed from a systematic sampling method involving the selection of households from an ordered sampling frame. A random starting point was first selected before enumerators began to follow a sampling interval of every 10th household to pick up a household for interview.

The survey team targeted to interview 100 households in each LGA to obtain an overall sample size of 400 households across the two states. In the end, 399 households were successfully interviewed, with an uneven distribution across the four locations (see Table). It is important to point out that as with most non-probabilistic sampling methods, the results from the Lagos-Kano household survey, and which are presented in the sections below, must be taken with caution and cannot be used to infer generalisations over the overall population in Nigeria, but rather, to describe patterns and relationships occurring in the locations under analysis.

Table 1: Sample target and achievement

States and LGAs	Targeted sample	Achieved sample
Lagos	200	199
Ikeja	100	100
Amuwo Odofin	100	99
Kano	200	200
Sabongari	100	87
Ungogo	100	113
Urban	200	174
Rural	200	225
Total	400	399

Source: Lagos-Kano household survey.

The survey questionnaire was designed to capture retrospective information on current and previous welfare outcomes, back to 2006 as the pre-crises starting point.[4] The use of retrospective data is increasingly being used in developing countries where pre-test and post-test data is often not available. Cost and administrative factors often limit regular collection of household data, and in our case, and with no existing disaggregated data at LGA level, retrospective questions were the best available option to capture key information on the variability of welfare outcomes during the periods in which the crises in question were observed. The rationale of our implementation strategy was based on the knowledge that the food and fuel price variability appeared in the years 2007, 2008, with a peak in 2009 for the former, especially in southern states, whereas the onset of the global financial crisis began in September 2008 and extended throughout 2009. More precisely, Nigeria was faced with food price variation beyond the observed long-term upward steady trend during 2007, 2008 and 2009, whereas the fuel price increase was perceived during 2006 and 2008. The sole effect of the food price variability may be captured in 2007, whereas the sole effect of the fuel price increases, in 2006. The effects of the global financial

4 Questionnaire is available on request.

crisis may be captured in 2008 and in 2009 with the latter also likely to reflect more recent food price variability.

Retrospective data thus allows us to measure the changes in reported welfare outcomes in those years and across the locations under examination, under the assumption that any observed change in outcomes is correlated with these covariate shocks, and to a lesser degree, to idiosyncratic events. There are two major limitations in this strategy: first, given that data on food and fuel prices is disaggregated at the state level, and having covered only two states through the household survey, we are unable to use price data to identify the impact of the food and fuel price variability through the econometric strategy and thus, we cannot separate the effects of the food and fuel crises, particularly in the years when more than one covariate shock was observed. In those cases, we cannot tell with precision whether a decline in welfare outcomes, say schooling, was due to a food price increase or because of the effect of a channel through which the global financial crisis was transmitted. Nonetheless, we can provide information about changes in welfare outcomes over the periods in which these crises were observed, and estimate the predicted probabilities that these changes in welfare were associated with the crises.

Second, retrospective data can generate recall errors that can be systematically correlated with explanatory factors, particularly when the questions involved aim at measuring outcomes of subjective nature that are difficult for people to accurately remember. Recall errors can generate downward bias in the estimated coefficients. Several studies have shown that recall errors arising from retrospective data seem to be systematically correlated with household composition, suggesting that the inclusion of household size or any other intra-household related variable as controls in the regression equations can mitigate these biases (see Gibson 2002, Gibson and Kim 2007, Battistin et al. 2003, Nakata et al. 2009). Therefore, we include in our specification strategy the dependency ratio to mitigate the potential effects of recall errors, and focus primarily on objective rather than subjective outcomes to limit other sources of biases. Nevertheless, our results should be treated with caution more in terms of impact size than on their direction or statistical power.

4 Analytical approach

In order to measure the impact of the food, fuel and financial crises, we have adopted three estimation strategies: first, we estimate a probit model based on an underlying response variable y_i^* that is defined by

$$y_i^* = X_i\beta + u_i \tag{1}$$

where we can only observe a categorical outcome, y, that takes the values $y=1$ if $y_i^* > 0$ (if households report an outcome over the 2007-10 period, and y=0, otherwise. From equation (1) we estimate the predicted probabilities of observing the outcomes of interest, y, by computing

$$\Pr(Y=1 \mid X_i) = \int_{-\infty}^{X_i\beta} \phi(t)dt = \Phi(X_i\beta) \tag{2}$$

where $\phi(\cdot)$ and $\Phi(\cdot)$ are the density of the distribution function and the cumulative distribution function of the standard normal, respectively, and X is a vector of household characteristics that contains the following control variables: (1) a dummy variable that takes the value 1 if the household head is female, and zero otherwise; (2) a continuous variable that measures the age of the household head; (3) the dependency ratio used as a proxy to intra-household composition to capture the liquidity requirements for consumption expenditure, and which also helps to mitigate recall errors arising from retrospective data in subsequent estimations.

Based on this specification, we run two models: Model I is estimated with a dummy variable that takes the value 1 if the household resides in Lagos, and zero if the household resides in Kano. Model II is estimated with a dummy variable that takes the value 1 for households living in urban areas (including Ikeja in Lagos and Sabongari in Kano), and zero for households residing in rural areas (in this case Amuwo Odofin in Lagos and Ungogo in Kano). By estimating equation (2), we are able to derive the marginal effects of one unit change in the explanatory variables contained in vector X, including the state and area dummies, on the probability of a change in the outcome variable over the 2007-10 period in which the crises were observed.

Second, as the LKHS also collected discrete response variables of ordering nature, we estimate ordered probit equations, built as an extension of equation (1) where X is the same vector of household characteristics described above, but y is now observed having the following values: $y = 0$ if $y_i* < 0$, i.e. if the outcome variable in year *t-1* was worse than in year *t*; $y = 1$ if $0 < y_i* < m_1$, i.e. if the outcome variable in year *t-1* remains equal or unchanged to year *t*, and $y = 2$ if $m_1 < y_i* < m_2$, i.e. if the outcome variable in year *t-1* was better than in year *t*. The latent variable can be seen as the propensity of households perceiving a change in welfare as a consequence of the factors in X over the periods in which the food, fuel and financial crises were observed, with m_ς and β_s being the unknown parameters.

Finally, given that some continuous welfare outcomes exhibit a censored distribution, taking a maximum value and a lower zero threshold, our third estimation strategy adopts a Tobit model of similar structure as in equation (1), but now $Y_i=\max(0,Y^*)$, i.e. $Y_i=Y^*$ if $Y^* > 0$ for households reporting making welfare-related decisions in times of crisis and $Y^* = 0$ if $Y^* \leq 0$ otherwise, where the errors, given the information in X, are assumed to be normally distributed.

By adopting a Tobit specification equation we were able to capture a more precise measure of the determinants of censored outcomes in the periods under which the crises were observed. The Tobit model is based on the assumption that the probability of observing $Y_i > 0$ and $Y_i = 0$ are $\phi(\cdot)$ and $p(Y_i^* < 0) = \Phi(\cdot)$, respectively, where $\phi(\cdot)$ and $\Phi(\cdot)$ denote the density function and the cumulative density function of the standard normal. The Tobit model generates three conditional mean functions.[5] We are particularly interested in examining the observed factors affecting the incidence of

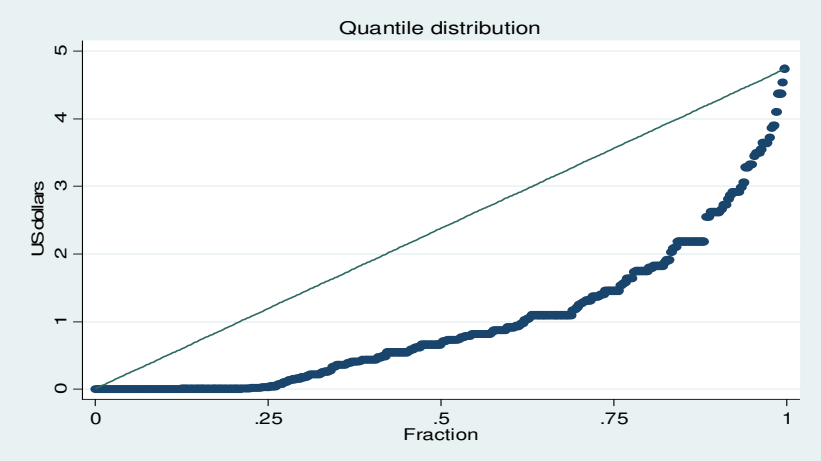
[5] For further details on the derivation of the conditional mean functions, see Greene (2003).

the welfare outcomes in the 2007-10 period. In the following sub-sections we present the empirical results.

5 Analysis

As discussed earlier, the LKHS was conducted in deprived localities of Lagos and Kano and the quantile distribution of per capita income in Figure 2 confirms the level of deprivation among the sample population. Overall, more than two-thirds of households lived on less than US$1.25 a day, and the remaining 30 per cent had income levels that place them in a state of vulnerability.

Figure 2: Daily per capital income in US$ (2010)



Source: authors' estimations.

In order to get a more precise profile of households, we estimated the Foster-Greer-Thorbecke (FGT) poverty measures (Foster et al. 1984) that take the following form

$$FGT=\frac{1}{n}\sum_{i=1}^{n}\left(\frac{z-y}{z}\right)^{\propto} \qquad (3)$$

where z is the poverty line and α is the coefficient of variation taking the values $\alpha \geq 0$. For $\alpha = 0$, the FGT becomes the headcount ratio that measures the number of people below the poverty line, i.e. the poverty incidence. For $\alpha = 1$, the FGT becomes the poverty gap index, which captures the mean aggregate income shortfall relative to the poverty line across the sample population. In order words, the poverty gap index shows the amount of resources needed, in terms of per capita income, to bring the poor to the poverty line. For $\alpha = 2$, the FGT measures the squared poverty gap, and which captures the severity of deprivation by taking into account the degree of inequality among the poor. Our results are presented in Table 3.

All in all, our estimates show that 70 per cent of the surveyed households were below the World Bank's US$1.25 a day poverty line, using the purchasing power parity (PPP) conversion factors for 2005, whereas nearly 90 per cent were below the US$2.5 a day poverty line. In terms of regional differences, and focusing on the US$1.25 a day poverty line as reference point, households living in Kano reported a higher headcount index (73 per cent) than residents of the Lagos state (65 per cent), although the latter state reveals a higher squared poverty gap than Kano (42 per cent vis-à-vis

37 per cent), which seems to reflect the severity of poverty and inequality in areas of economic affluence in the country.

Table 2: FGT Poverty indices by sample population, state and area

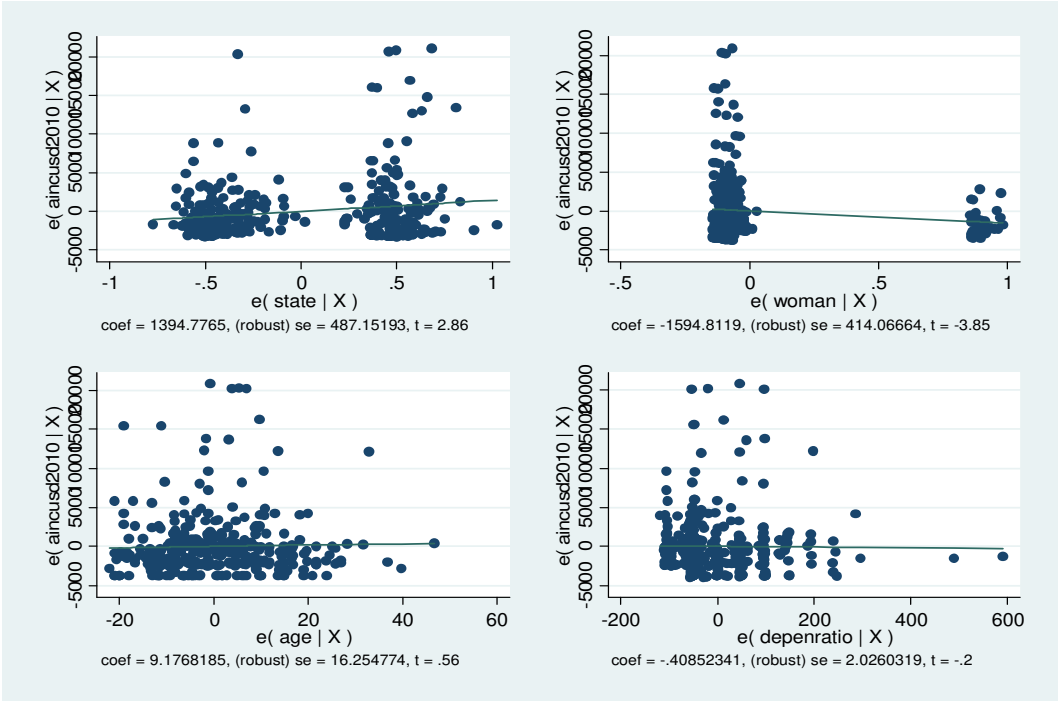
	FGT (1)			FGT (2)		
	α = 0	α = 1	α = 2	α = 0	α = 1	α = 2
Sample population	0.70	0.47	0.39	0.88	0.64	0.53
Kano	0.73	0.47	0.37	0.91	0.66	0.53
Lagos	0.65	0.48	0.42	0.83	0.61	0.52
Rural	0.66	0.41	0.30	0.88	0.61	0.47
Urban	0.74	0.54	0.49	0.87	0.67	0.59

Note: the FGT poverty indices in (1) are derived using the World Bank's US$1.25 a day poverty line, whereas in (2), they are derived using the World Bank's US$2.5 a day

Source: Lagos-Kano household survey.

In order to estimate the determinants of earning capacity, we regressed the annual household income in US$ of 2010 using a similar specification strategy as derived in equation (1). The results are presented as partial regression plots in Figure 3. The slope coefficients suggest that households living in Lagos have, on average, an annual income of US$1,395 (approximately US$3.8 a day) higher than the incomes reported from households living in Kano, which is similar to the income differentiation found between urban and rural areas (US$1,384). Equally important is the fact that the scattergrams reveal that, ceteris paribus, households headed by females have on average incomes significantly lower than households headed by men, at approximately US$133 less, and the results are significant at 1 per cent level. This brings a gender dimension into the issue of extreme poverty and vulnerability in the states and areas under investigation. In the following sub-sections we turn to the impact of the food price variability.

Figure 3: Partial regression plots by state



Source: authors' estimations.

5.1 Food price increases

Besides the effect of global food markets, food price increases in Nigeria can be linked to domestic factors associated with unfavourable weather conditions, including droughts in northern regions of the country and flooding in the coastal areas of the south. In September 2007, food prices rose sharply following an early dry season in the northern regions. Across major markets in northern Nigeria, including the Dawanau Market in Kano, retail prices of maize, millet, cowpeas and sorghum were reported to be significantly higher than in 2006 (USAID 2007). Food prices remained high following the price rise of diesel that increased the cost of food transportation.

In coastal areas, including Lagos, concerns about food insecurity arose due to the effects of severe floods that occurred in 2009. Mobility of food traders was constrained by bad roads conditions, which drove food prices up. In the same areas, prices for maize and yam, the preferred substitutes for other staples such as rice, increased. By contrast, in northern states such as Kano, access to food was made easier by the combination of good food stocks (especially maize) and stable prices (see Figure 4 below).

Although the level of average food prices had not experienced extreme variability in the period under examination, food prices of items such as maize, sorghum, yam, gary and rice had steady rising trends that may have significantly affected food security and other welfare outcomes, given low price elasticities of demand for these products. And because price increases across these staples seem to follow similar patterns, the effect of cross-price elasticities may have reduced the ability of poor and vulnerable households to effectively substitute for food products.

As the LKHS collected retrospective information on the perceived increases in food prices, and the year the households recalled such increases to have occurred, we estimate the probabilities of households having experienced food price increases, conditional on a given vector of household characteristics. Table 3 presents the results from the two models derived in Section 4. From Model I, we find a 45 per cent higher chance that a household in Lagos experienced food price increases vis-à-vis households living in Kano, after controlling for the gender of the household head, dependency ratio and the age of the respondent. There is also a 0.6 per cent chance that households headed by older members suffered price increases. Increasing prices reduced household disposable incomes, thus potentially reducing households' well-being.

In the second model, we control for the location of the household – whether it is in an urban or rural environment. The model shows a more significant relationship between age of head of household and the probability of experiencing rising food prices. Again urban households experienced more risks of food price increases than rural households. This comes as no surprise given that rural households are producer-consumers, and hence are less reliant on food markets for their consumption. Our findings are also consistent with domestic price trends of staples reported by the National Bureau of Statistics (see Figure 4).

Table 3: Probability of experiencing a food price increase

Independent variables	Probit I (mfx)	Probit II (mfx)
State	0.445***	
	(0.0645)	
Woman	-0.0682	0.00712
	(0.142)	(0.140)
Depenratio	0.000525	8.04e-05
	(0.000331)	(0.000330)
Age	0.00585*	0.00636**
	(0.00316)	(0.00313)
Area		0.149**
		(0.0737)
Observations	215	215
Pseudo R-squared	0.140	0.0230

Note: Robust standard errors in parentheses; *significant at 10%; **significant at 5%; ***significant at 1%.

Source: authors' estimations.

Given the adverse effects of food price increases, we identify strategies adopted by vulnerable households to cope with food price variability. Correlation analysis indicates that residents of Lagos were more likely to shift consumption to substitute goods which were cheaper. They also adopted radical measures like reducing food consumption, especially among mothers and children. They resorted to consumption smoothing, and also worked longer hours to compensate for income lost through price increases. Residents of Kano relied more on dissaving and borrowing to cope with rising food prices. Households also resorted to withdrawing their children from school, either because they could not afford the school fees, or because they wanted the children to assist with mobilising financial resources for the upkeep of the family, leading to an increase in the incidence of child labour. Although these strategies are generally short-term, they often have long-term implications for household welfare. In the following sections, we focus on school dropouts and child labour as relevant welfare losses that might arise from these coping strategies.

5.2 School dropouts

The rationale of examining the relationship between food price variability and school dropouts comes from evidence showing a strong relationship between poor academic and cognitive performance and food insecurity, which in turn impact on people's future inabilities to increase labour productivity and income (see Glewwe et al. 2009, Glewwe and King 2001, and also Masino and Niño-Zarazúa, forthcoming for a systematic review on the topic).

Early school dropouts impose constraints on children as they are unable to adapt to changing economic circumstances, nor to effectively use their knowledge and skills to exploit social arrangements and income opportunities more easily (Becker 1993). Education also helps children to make informed decisions in adulthood, and to be treated with respect in given social contexts.

The LKHS collected information about school dropouts, the year of occurrence as well as the reasons that led to a deterioration in school performance and ultimately,

school dropouts. An initial examination of the data (presented in Table 4) reveals a significant jump in the reported incidence of school dropouts during 2008, which coincides with the global financial crisis. We also find a significant correlation at the 5 per cent level, in the higher rates of school dropouts in Lagos relative to the rates observed in Kano. Strikingly, the correlations suggest that the rate of school dropouts is more severe in rural areas of Lagos and Kano, and that pattern may also be capturing attitudes toward schooling in rural communities of Nigeria. These correlations, however, do not provide more precise information on other determinants of school dropouts.

Table 4: Year of school dropout (all children)

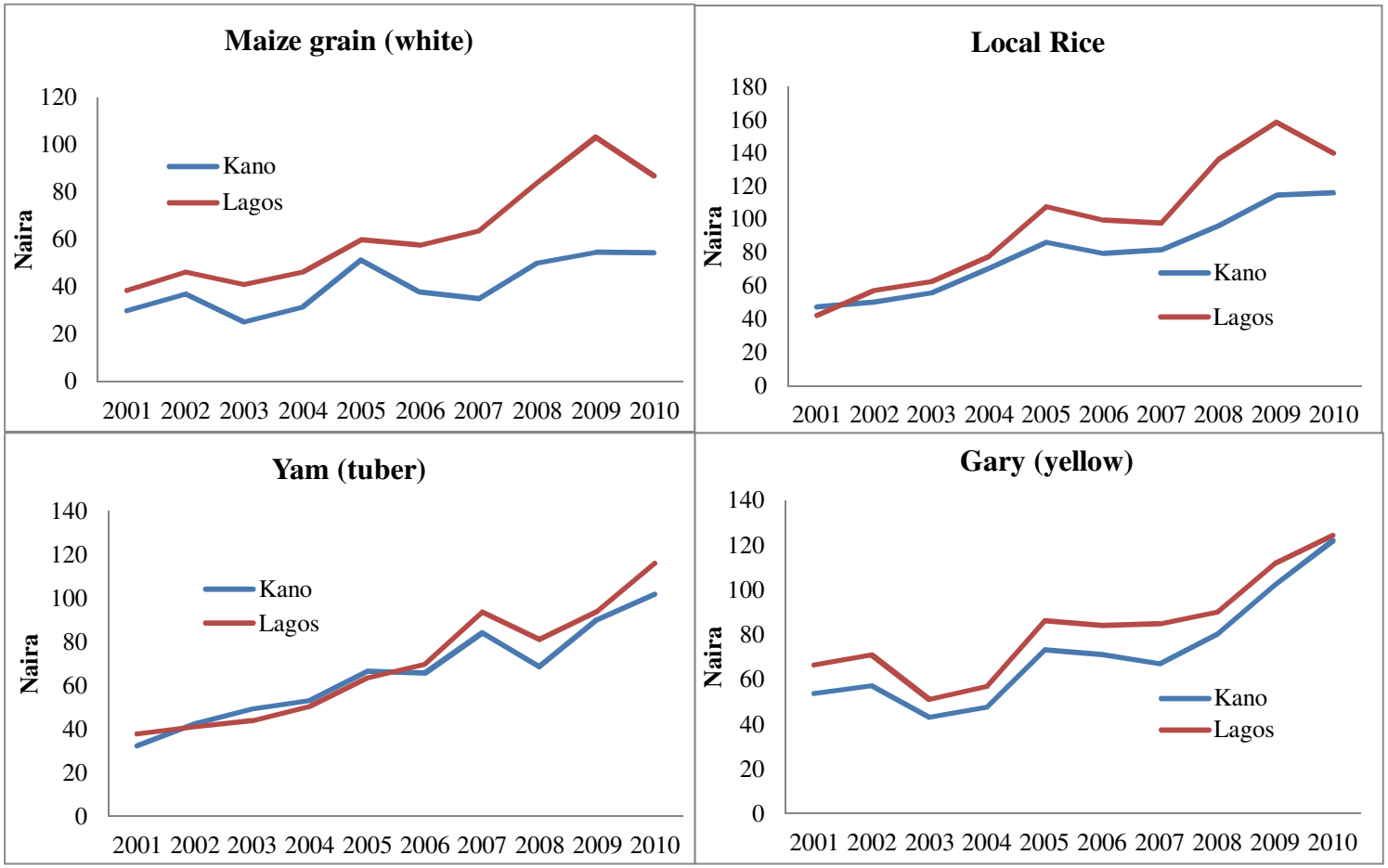
Year of school dropout	Area				State			
	Rural		Urban		Kano		Lagos	
	Freq	Percent	Freq	Percent	Freq	Percent	Freq	Percent
None	211**	(90.56)	186**	(92.54)	199**	(91.71)	198**	(91.24)
< 2006	6**	(2.575)	1**	(0.498)	6**	(2.765)	1**	(0.461)
2007	1**	(0.429)	5**	(2.488)	1**	(0.461)	5**	(2.304)
2008	14**	(6.009)	5**	(2.488)	7**	(3.226)	12**	(5.530)
2009			2**	(0.995)	1**	(0.461)	1**	(0.461)
2010	1**	(0.429)	2**	(0.995)	3**	(1.382)		
Total	233		201		217		217	

Note: The statistically significant association in the cross-tabulations is indicated by the Chi-square values for the cell as a whole: *significant at 10%; **significant at 5%; ***significant at 1%.

Source: authors' estimations.

In order to estimate the propensity of school dropouts by year of occurrence, we estimate a probit model similar to the one derived in Section 4, where the dependent variable y takes the value $y = 1$ if a child stops going to school before completing the grade, and $y = 0$ otherwise. We include the same vector of household characteristics X derived earlier but now we include a dummy variable 'girl', in substitution of 'women', to control for the effects of being a girl on the probability of dropping out school. The marginal effects of the slope coefficients are presented in the Appendix Table A1.

Figure 4: Average annual prices of key staples by locality (prices in Naira per kilo)

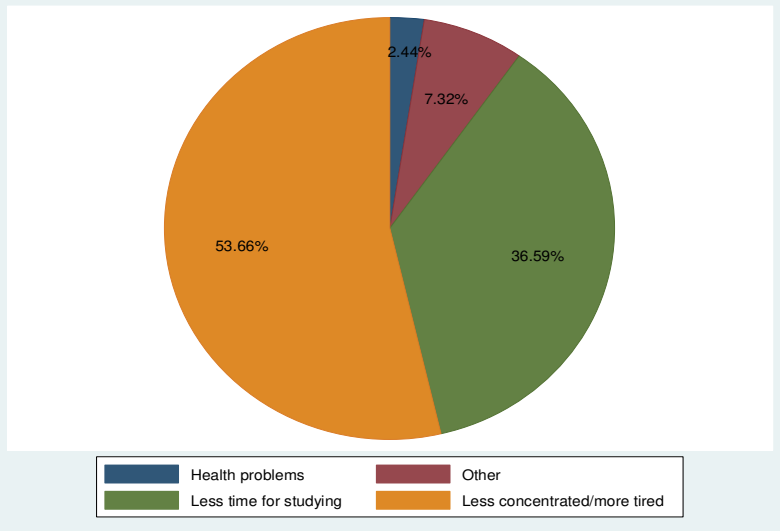


Source: authors' calculations based on data from the National Bureau of Statistics.

The results are statistically insignificant for most variables, with one exception: being a girl increases the probability of experiencing an early school dropout. In 2006 and 2007, a girl living in Lagos faced, on average, a 2 per cent higher probability of dropping out school than a boy living in the same locality. By 2008, the odds of a girl dropping out school had increased up to 10 per cent and the strength of the correlation is significant at the 1 per cent level. A similar pattern is also found among girls living in urban areas. The evidence suggests that there is a connection between increasing the likelihood of dropping out of school and aggregate shocks, particularly given the jump of the coefficient in 2008. However, given the possibility of lag effects arising from the food price variability of 2007, it is unfeasible to separate the two effects.

Indeed, Figure 5 shows that more than half of those children who reported a decline in school performance (which ultimately led to school dropouts) could concentrate less, were more tired, and had less time for studying. The former cause is linked to the issue of food insecurity, whereas the latter, to the prevalence of child labour. We discuss the issue of child labour in the next section. All in all, the results reveal a significant gender bias in terms of educational opportunities for children, with covariate shocks exacerbating the prevailing gender inequalities, which in turn limit girls' prospects for future labour market opportunities.

Figure 5: Causes for a deterioration in school performance



Source: authors' estimations.

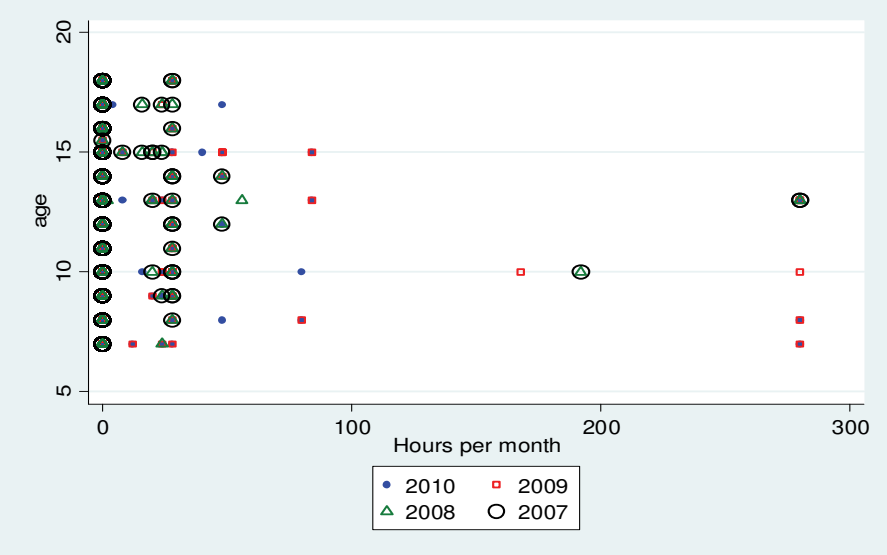
5.3 Child labour

Child labour, in its various forms, is often associated with poverty, household composition, social norms and labour market conditions (Grootaert and Kanbur 1995). In environments of aggregate vulnerabilities, and where substitution effects exist between parents' and children's time use, child labour becomes an important source of income. Patrinos and Psacharopoulos (1997) pointed out that the mutually opposing direction between schooling and child labour may not necessarily be so if child labour does not act as substitute of children's time in school. Other studies have also pointed out that child labour often facilitates children's school progression, as it lifts household's budgetary constraints (Maharatna 1997, Grootaert 1998, Weiner

1991). Thus, our concern has more to do with the intensity of child labour and its harmful forms than with its existence.

In Figure 6, we plot the number of hours children worked during the 2007-10 periods relative to their age. The scatter plot shows that the incidence of child labour during 2007 and 2008 began at the age of six, with these frequencies showing a low intensity of labour in terms of hours worked relative to children of similar age during 2009 and 2010. The small hollow squares in red (7.32 percent) on the lower right-hand side of the scattergram show small children being engaged in full-time productive activities, and this may connect with our earlier discussion on the factors that cause deterioration of school performance and dropping out of school during that period. Nevertheless, it is important to highlight the fact that more than 90 per cent of children were not engaged in productive activities, and most of those that were working at the time the survey was conducted, did work part time, in a range of 30 to 50 hours per month. Although illustrative, Figure 5 provides limited information about the factors that determine child labour, and whether these determinants change over the periods under which the food, fuel and 2008 financial crisis became apparent.

Figure 6: Intensity of child labour by age and reported year



Source: authors' estimates.

Given the censored distribution of the number of hours children worked during the 2007-10 periods, which takes a maximum value and a lower threshold zero (see the observations clustered around zero hours on the left hand-side of Figure), we decided to estimate a Tobit model as derived in Section 4, but now $Y_i = \max(0, Y^*)$, i.e. $Y = Y^* \text{ if } Y^* > 0$ for children engaged in labour activities, $Y^* = 0 \text{ if } Y^* \leq 0$ for children who are not engaged in productive activities, with the standard errors following a normal distribution. By adopting a Tobit specification equation, we were able to capture a more precise measure of the determinants of child labour in the periods under examination. The Tobit model generates three conditional mean functions. We are particularly interested in examining the observed factors affecting the incidence of child labour in the 2007-10 periods. The results from the Tobit equations are presented in Tables 5a and 5b.

Overall, the results show that, other things held constant, age and the dependency ratio are positively correlated with the propensity of child labour. Both results are consistent with our expectations and statistically significant at the 1 per cent level. First, the intensity of child labour increases as children get older and become able to generate income for the family. Second, higher dependency ratios seem to impose greater liquidity requirements on households to satisfy their consumption needs, and as the budgetary constraints increase, so do the incentives for parents to use older children's time to generate income. The results also show that children living in Lagos have, on average, a lower propensity to work relative to children living in Kano. The results are consistent over the period under examination and statistically significant at the 1 per cent level. We observe a moderate decline in the number of hours worked, from 102 hours per month in 2007 to 98 hours in 2008, to then increase to 106 hours per month in 2009.

Table 5a: Incidence of child labour by year (dependent variable: number of hours worked per month)

Independent variables	Tobit I				Tobit II			
	2007	2008	2009	2010	2007	2008	2009	2010
State	-102.2***	-98.20***	-106.7***	-91.44***				
	(38.58)	(34.17)	(34.12)	(26.02)				
Area					-121.4***	-116.8***	-74.55**	-30.34
					(45.28)	(40.54)	(30.14)	(20.97)
Woman	22.96	14.82	12.73	-9.929	17.65	10.06	9.048	-12.48
	(24.97)	(21.59)	(21.67)	(17.50)	(24.49)	(21.23)	(21.27)	(17.62)
Depenratio	0.342***	0.364***	0.438***	0.307***	0.337***	0.359***	0.447***	0.344***
	(0.105)	(0.0897)	(0.0885)	(0.0708)	(0.104)	(0.0885)	(0.0892)	(0.0737)
Age	13.60***	12.76***	12.33***	9.008***	12.68***	11.92***	11.66***	8.555***
	(3.495)	(3.015)	(2.797)	(2.087)	(3.413)	(2.945)	(2.758)	(2.095)
Constant	-430.2***	-389.5***	-393.7***	-289.3***	-413.9***	-375.1***	-392.4***	-306.4***
	(78.76)	(66.02)	(60.37)	(42.46)	(76.92)	(64.53)	(60.74)	(44.86)
Observations	779	779	779	779	779	779	779	779

Note: Robust standard errors in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. The 'state' variable is dummy with a value Lagos=1 and Kano=0; 'woman' is a dummy with value woman=1, man=0; 'depenratio' measures the dependency ratio; age measures the age of the household head, and 'area' is a dummy with a value urban=1 and rural=0. Model I: Equation with state as explanatory variable. Model II: Equation with area as explanatory variable.

Source: authors' estimations.

In Table 5b, we estimate a Tobit equation using logarithmic functions of the number of hours worked per month, which by taking the antilog of the slope coefficients, allows us to calculate the percentage change in the propensity of child labour. The results from 2007 suggest that the *median* of the propensity of child labour in Lagos was lower than the one observed in Kano by approximately 99.4 per cent (i.e. $e^{-5.138} = -0.994$). The higher incidence of child labour in Kano during that year coincides with a sharp increase in food prices, following the unfavourable weather

conditions registered that year, which may have pushed families to embark on drastic coping mechanisms, including child labour, in an effort to ease the negative income effect from the food price increase.

The high propensity of child labour in Kano during 2009 remains unclear given that weather conditions during that year were relatively stable. Equation Tobit II, which includes a dummy that controls for urban *versus* rural areas suggests that while the higher propensity of child labour observed during 2007 can be indeed associated with the rural labour markets, the peak observed in 2009 is less pronounced in rural areas. That suggests that factors other than food price variability might be associated with the higher propensity of child labour in that particular year.

Table 5b: Incidence of child labour (dependent variable: logarithm of the number of hours worked per month)

Independent variables	Tobit I 2007	2008	2009	2010	Tobit II 2007	2008	2009	2010
State	-5.138***	-5.067***	-5.000***	-4.468***				
	(1.817)	(1.642)	(1.502)	(1.239)				
Area					-5.759***	-5.681***	-3.272**	-1.553
					(2.112)	(1.925)	(1.321)	(1.010)
Woman	0.877	0.479	0.597	-0.465	0.618	0.238	0.434	-0.595
	(1.151)	(1.013)	(0.934)	(0.830)	(1.142)	(1.009)	(0.936)	(0.847)
Depenratio	0.0162***	0.0181***	0.0195***	0.0153***	0.0163***	0.0182***	0.0204***	0.0173***
	(0.00493)	(0.00432)	(0.00392)	(0.00343)	(0.00493)	(0.00432)	(0.00405)	(0.00362)
Age	0.696***	0.672***	0.575***	0.467***	0.659***	0.637***	0.552***	0.447***
	(0.168)	(0.148)	(0.124)	(0.101)	(0.166)	(0.146)	(0.125)	(0.103)
Constant	-20.41***	-18.95***	-17.36***	-14.08***	-19.96***	-18.56***	-17.71***	-15.06***
	(3.852)	(3.290)	(2.754)	(2.129)	(3.818)	(3.265)	(2.837)	(2.274)
Observations	779	779	779	779	779	779	779	779

Note: see Table 5a.
Source: authors' estimations.

5.4 Employment opportunities

Labour markets are a fundamental channel through which covariate shocks affect poor and vulnerable households. For the poor and vulnerable with limited capital endowments, income-generating activities, self-employment and seasonal waged labour represent the most important sources of income. Data from the LKHS shows that only 27 per cent of household members were waged employees and this reflects the heavy reliance of the poor and vulnerable on self-employment and informal labour arrangements.

The survey collected information on the number of days per week household members worked during the hungry season, as during that period (April-July) the poor and vulnerable, particularly in rural areas, face the highest level of food insecurity. We generate an outcome variable that captures work intensity, and which is computed as the sum of units of labour (measured in days) members of the household worked over that season. A closer examination of this variable reveals a censored distribution,

as more than 10 per cent of the sampled households were not engaged in income-generating activities or waged work by the time the survey was conducted. For that reason, we estimate a Tobit equation. Since we have a data censoring case demanding the latent variable to follow a homoskedastic normal distribution, we transform Y_i into logarithmic form to make this assumption more reasonable. The results from the Tobit regression equations are presented in Tables 6a and 6b.

Table 6a: Intensity of labour during the hungry season (dependent variable: number of days per week household members worked during the hungry season (April-July))

Independent variables	2007 Tobit I	Tobit II	2008 Tobit I	Tobit II	2009 Tobit I	Tobit II	2010 Tobit I	Tobit II
State	-1.147		-2.226		-0.0871		-3.960	
	(8.985)		(8.782)		(9.135)		(8.381)	
Woman	-14.63	-14.15	-11.12	-10.66	-10.74	-10.21	-12.11	-11.98
	(15.01)	(14.94)	(14.65)	(14.58)	(15.25)	(15.19)	(13.99)	(13.93)
Depenratio	0.0412	0.0309	0.0452	0.0348	0.0323	0.0222	-0.0167	-0.0228
	(0.0490)	(0.0480)	(0.0479)	(0.0469)	(0.0498)	(0.0488)	(0.0460)	(0.0451)
Age	6.777***	6.768***	6.957***	6.964***	7.510***	7.490***	8.818***	8.864***
	(1.860)	(1.850)	(1.819)	(1.808)	(1.894)	(1.884)	(1.743)	(1.733)
Age2	-	-	-	-	-	-	-	-
	0.0656***	0.0663***	0.0672***	0.0680***	0.0729***	0.0733***	0.0882***	0.0893***
	(0.0200)	(0.0199)	(0.0195)	(0.0194)	(0.0203)	(0.0202)	(0.0187)	(0.0186)
Area		-11.61		-13.13		-9.960		-11.36
		(8.830)		(8.630)		(8.976)		(8.237)
Constant	-10.29	-3.021	-13.37	-6.116	-26.65	-19.59	-41.54	-37.39
	(42.35)	(41.79)	(41.41)	(40.83)	(43.13)	(42.54)	(39.64)	(39.09)
Observations	392	392	392	392	392	392	392	392

Note: see Table 5a.

Source: authors' estimations.

Overall, the results show that, other things held constant, the age and age squared variables are consistent with what theory would predict, i.e. an increasing relationship between work and age, but at a decreasing rate: in 2007, an additional year of age increased the propensity of days household members worked during the hungry season by 9.5 per cent, which represents about 6.8 days per week. And that rate dropped by 0.1 per cent every year. We also observe a steady increase in the level of work intensity relative to age in subsequent years (2008, 2009 and 2010), and those results are significant at the 1 per cent level.

Table 6b: Intensity of labour during the hungry season (dependent variable: logarithm of days per week all household members worked during the hungry season (April-July))

Independent variables	2007 Tobit I	Tobit II	2008 Tobit I	Tobit II	2009 Tobit I	Tobit II	2010 Tobit I	Tobit II
State	0.00789		-0.0119		0.0636		-0.0352	
	(0.170)		(0.161)		(0.175)		(0.0411)	
Woman	-0.270	-0.257	-0.148	-0.133	-0.218	-0.201	-0.0986	-0.106
	(0.283)	(0.282)	(0.269)	(0.267)	(0.292)	(0.291)	(0.0686)	(0.0683)
Depenratio	0.00135	0.00112	0.00160*	0.00132	0.00140	0.00114	-6.96e-05	-4.13e-06
	(0.0009)	(0.0009)	(0.0008)	(0.0008)	(0.0009)	(0.0009)	(0.0002)	(0.0002)
Age	0.0954***	0.0948***	0.102***	0.101***	0.112***	0.110***	0.0363***	0.0365***
	(0.0351)	(0.0349)	(0.0333)	(0.0331)	(0.0362)	(0.0360)	(0.00901)	(0.00902)
age2	-0.00118***	-0.00118***	-0.00124***	-0.00125***	-0.00133***	-0.00133***	-0.000292***	-0.000292***
	(0.000376)	(0.000374)	(0.000358)	(0.000355)	(0.000388)	(0.000386)	(9.93e-05)	(9.94e-05)
area		-0.218		-0.285*		-0.160		0.00828
		(0.167)		(0.158)		(0.172)		(0.0402)
Constant	2.721***	2.886***	2.612***	2.806***	2.277***	2.456***	4.125***	4.092***
	(0.799)	(0.788)	(0.760)	(0.747)	(0.824)	(0.813)	(0.199)	(0.198)
Observations	392	392	392	392	392	392	365	365

Note: see Table 5a.

Source: authors' estimations.

Further, we find a negative relationship between both the 'state' and 'area' variables and the proxy indicator for work intensity. There is an increase in labour supply during 2008 and 2010, which might reflect how poor rural households cope with food insecurity during periods of food inflation and aggregate vulnerabilities. However, although the information suggests that residents of Lagos, and especially in urban areas, were not forced to work as much as people living in Kano and in rural areas, the correlations were not strong enough, in statistical terms, to confirm that association. The only exception is 2008 as during that year, the *median* of the propensity of work intensity in Lagos was lower than that of Kano by approximately 24.8 per cent. The results are in line with our findings with regard to child labour, which point at children living in Lagos having on average a lower propensity to work, relative to children living in Kano.

6 Conclusion

This study has examined the impacts of the food, fuel and financial crises on livelihoods of low-income households in Nigeria using household survey data. It started with a general analysis of the origins of the crises, followed by an analysis of

the impacts, especially on SSA. It has been shown that the crises had differential impacts within and between countries. Some countries responded to the food crisis by banning exports, while others reduced and/or removed trade taxes. In SSA in particular, the crises resulted in social unrest, rising inflation and growth in poverty, among other adverse effects and these outcomes differed between countries. In the case of Nigeria, it has been shown that the fuel crisis did not have significant impact because of the price subsidisation.

The financial crisis did not seem to have significant direct micro-level impacts because remittances did not fall significantly, and the country is not aid-dependent. Yet, our results indicate that aggregate shocks had a significant adverse effect on household consumption, human capital and labour decisions with a degree of variability in their impacts and coping mechanisms between northern and southern areas of the country. The food crisis had the most severe and significant impact on poor and vulnerable households. It is important to point out that the food price variability observed in Nigeria has as much (if not more) to do with domestic factors associated with erratic weather conditions and poor transport infrastructure, as with variations in international food prices.

The analysis also finds that in general, households responded to the crises in various ways, including increasing the intensity of work, withdrawing children from school, especially girls, shifting consumption to cheap substitutes, and engaging their children in child labour. These decisions were found to vary according to regional and rural-urban conditions.

Early school dropouts and the active engagement of children in labour activities are in particular sources of great concern, as they impose constraints on children's future welfare prospects that can potentially lock them in a low economic equilibrium or poverty trap. The fact that gender bias in terms of educational opportunities is pervasive – with covariate shocks exacerbating the prevailing gender inequalities – underlines the need for policy responses that while addressing the effects of covariate risks more generally, can also deal with important sources of inequalities.

References

Baffes, J. (2007). 'Oil Spills on Other Commodities'. *Resources Policy*, 32 (3): 126-134.

Baker, J.I. (2008). 'Impacts of Financial, Food, and Fuel Crisis on the Urban Poor. Directions: Urban Development. Washington, DC: World Bank, Urban Development Unit.

Barnard, J. (1983). 'Gasohol/Ethanol: A Review of National and Regional Policy and Feasibility Issues'. *Regional Science Perspectives*, 13 (2) 3-14.

Battistin, E., Miniaci, R., and Weber, G. (2003). 'What do we Learn from Recall Consumption Data?'. *Journal of Human Resources*, 38 (2): 365-385.

Becker, G.S. (1993). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*, 3rd Edition. Chicago: University of Chicago Press.

Baulch, B., and Masset, E. (2003). 'Do Monetary and Nonmonetary Indicators Tell the Same Story About Chronic Poverty? A Study of Vietnam in the 1990s'. *World Development*, 31 (3): 441-453.

Campello, M., Graham, J., and Harvey, C. (2009). 'The Real Effects of Financial Constraints: Evidence from a Financial Crisis. Working Paper 15552. Cambridge, MA: NBER.

Chen, S., and Ravallion, M. (2009). 'The Impact of the Global Financial Crisis on the World's Poorest'. VOX, Portal of the Centre for Economic Policy Research. London: CEPR.

Chen, S.T.; Kuo, H.I., and Chen, C.C. (2010). 'Modeling the Relationship between the Oil Price and Global Food Prices. *Applied Energy*, 87 (8): 2517-2525.

Chen, X.; Huang, H.; Khanna, M., and Onal, H. (2011). 'Meeting the Mandate for Biofuels: Implications for Land Use, Food and Fuel Prices'. National Bureau of Economic Research. Available at: http://ageconsearch.umn.edu/bitstream/61629/2/AAEA%202010_Xiaoguang%20Chen.pdf

Crotty, J. (2008). 'Structural Causes of the Global Financial Crisis: A Critical Assessment of the New Financial Architecture'. Working Paper 180. Amherst, MA: Political Economy Research Institute.

DfID (2012). 'Gender in Nigeria Report: Improving the Lives of Girls and Women In Nigeria – Issues, Policies Action', 2nd Edition. British Council Nigeria. Available at: http://www.dfid.gov.uk/Documents/publications1/Gender-Nigeria2012.pdf

Diao, X.; Headey, D., and Johnson, M. (2008). 'Toward a Green Revolution in Africa: What Would it Achieve, and What Would it Require? *Agricultural Economics*, 39 (s1): 539-550.

FAO (2011). 'Addressing High Food Prices: A Synthesis Report of FAO Policy Consultations at Regional and Sub-Regional Level'. Available at: http://www.fao.org/fileadmin/user_upload/ISFP/High_food_prices_synthesis_CFS_FINAL.pdf

Foster, J., Green, J., and Thorbecke, E. (1984). 'A Class of Decomposable Poverty Measures'. *Econometrica*, 52: 761-766.

Gibson, J. (2002). 'Why Does the Engel Method Work? Food Demand, Economics of Size and Household Survey Methods. *Oxford Bulletin of Economics and Statistics*, 64 (4) 341-359.

Gibson, J., and Kim, B. (2010). 'Non-Classical Measurement Error in Long-Term Retrospective Recall Surveys'. *Oxford Bulletin of Economics and Statistics*, 72 (5): 687-695.

Goodhart, C. (2008). 'The Regulatory Response to the Financial Crisis'. Working Paper 2257, Category 6. Monetary Policy and International Finance.

Greene, W. (2003). 'A Interpreting Estimated Parameters and Measuring Individual Heterogeneity in Random Coefficient Models'. Working Paper 03-19, New York University, Leonard N. Stern School of Business, Department of Economics.

Glewwe, P., and King, E.M. (2001). 'The Impact of Early Childhood Nutritional Status on Cognitive Development: Does the Timing of Malnutrition Matter?'. *The World Bank Economic Review*, 15: 81-113.

Glewwe, P., Kremer, M., and Moulin, S. (2009). 'Many Children Left Behind? Textbooks and Test Scores in Kenya'. *American Economic Journal: Applied Economics*, 1: 112-135.

Grootaert, C. (1998). 'Child Labor in Côte d'Ivoire: Incidence and Determinants'. In Grootaert, C. and Patrinos, H.A. (eds), *The Policy Analysis of Child Labor: A Comparative Study*. New York: St. Martin's Press.

Grootaert, C, and Kanbur, R. (1995). 'Child Labour: An Economic Perspective'. *International Labour Review*, 134 (2): 187-203.

Hulme, D., and Shepherd, A. (2003). 'Conceptualizing Chronic Poverty'. *World Development*, 31 (3): 403-423.

IFPRI (2008). 'High Food Prices: "The What, Who, and How of Proposed Policy Actions"'. Policy Brief. Washington, DC: IFPRI.

IMF (2008). 'Food and Fuel Prices - Recent Developments, Macroeconomic Impact, and Policy Responses'. Available at: http://www.imf.org/external/np/pp/eng/2008/063008.pdf

Kaminsky. G.L., and Reinhart, C.M. (1996). 'The Twin Crises: The Causes of Banking and Balance-of-Payments Problems'. Available at: http://www.econ.uchile.cl/uploads/documento/7d5ce3d5eb3b2d4aa22077fb65a0322e520bcf2.pdf

Maharatna, A. (1997). 'Children's Work Activities, Surplus Labor and Fertility: Case Study of Six Villages'. *Birbhum Economic and Political Weekly*, 32: 363-369.

Masino, S., and Niño-Zarazúa, M. (forthcoming). 'What Works in the Education Policy in Developing Countries?'. A Systematic Review. Helsinki: UNU-WIDER.

Mishkin, F. S. (1999). 'Lessons from the Asian Crisis'. *Journal of International Money and Finance*, 18 (4): 709-723.

Nakata , H., Sawada, Y., and Tanaka, M. (2009). 'Asking Retrospective Questions in Household Surveys: Evidence from Vietnam'. Discussion Paper Series 10-E-008. Tokyo: RIETI.

Olomola, A.S. (2013). 'The Political Economy of food price policy in Nigeria'. Working Paper 2013/016. .Helsinki: UNU-WIDER.

Patrinos, H. A., and Psacharopoulos, G. (1997). 'Child Labor versus Educational Attainment: Some Evidence from Latin America'. *Journal of Population Economics* 10 (4): 377-386.

Senauer, B. (2008). 'Food Market Effects of a Global Shift towards Bio Energy'. *American Journal of Agricultural Economics*, 90 (5): 1226-1232.

Taylor, J.B. (2009). 'The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong'. Working Paper 14631. Cambridge, MA: NBER.

USAID (2007). 'Preliminary Livelihoods Zoning: Northern Nigeria. A Special Report by the Famine Early Warning Systems Network' Available at: http://pdf.usaid.gov/pdf_docs/PNADL380.pdf (Accessed 10 February 2013).

Von Urff, W. (2007). 'Biofules–A New Chance for Agriculture or a Threat to Food Security'. *Quarterly Journal of International Agriculture*, 46 (2): 99-104.

Weiner, M. (1991). 'The Child and the State in India: Child Labor and Educational Policy in Comparative Perspective'. Princeton, NJ: Princeton University Press.

World Bank (2008). 'Weathering the Storm: Economic Policy Responses to the Financial Crisis'. World Bank/PREM.

World Bank (2011). 'Migration and Remittances Factbook 2011, 2nd Edition'. Washington DC: International Bank for Reconstruction and Development/World Bank.

Appendix Table A1. Predicted probabilities of school dropouts by year (dependent variable: reported year of school dropout)

Year of school dropout	Independent variables	Ordered probit I (mfx)	Ordered probit II (mfx)
None	State	0.0101	
		(0.0259)	
	Girl	-0.204***	-0.200***
		(0.0554)	(0.0550)
	Depenratio	-0.000114	-0.000121
		(0.000102)	(0.000101)
	Area		0.00381
			(0.0260)
< 2006	State	-0.00168	
		(0.00442)	
	Girl	0.0250**	0.0247**
		(0.0117)	(0.0116)
	Depenratio	1.92e-05	2.02e-05
		(2.05e-05)	(2.05e-05)
	Area		-0.000639
			(0.00441)
2007	State	-0.00150	
		(0.00371)	
	Girl	0.0240**	0.0237**
		(0.0105)	(0.0106)
	Depenratio	1.71e-05	1.80e-05
		(1.79e-05)	(1.77e-05)
	Area		-0.000569
			(0.00384)
2008	State	-0.00520	
		(0.0133)	
	Girl	0.103***	0.101***
		(0.0367)	(0.0362)
	Depenratio	5.92e-05	6.23e-05
		(5.08e-05)	(4.91e-05)
	Area		-0.00197
			(0.0135)
2009	State	-0.000598	
		(0.00161)	
	Girl	0.0155	0.0150
		(0.0104)	(0.0103)
	Depenratio	6.79e-06	7.13e-06
		(7.06e-06)	(7.41e-06)
	Area		-0.000225
			(0.00149)
2010	State	-0.00108	
		(0.00305)	
	Girl	0.0367**	0.0359**
		(0.0170)	(0.0162)

Depenratio	1.23e-05	1.31e-05
	(1.26e-05)	(1.34e-05)
Area		-0.000413
		(0.00279)
Observations	427	427

Note: Robust standard errors in parentheses; *significant at 10%; **significant at 5%; ***significant at 1%. The 'state' variable is dummy with a value Lagos=1 and Kano=0; 'girl' is a dummy with value 1 if girl aged <18 and zero if boy; 'depenratio' measures the dependency ratio; age measures the age of the household head, and 'area' is a dummy with a value urban=1 and rural=0. Model I: Equation with state as explanatory variable. Model II: Equation with area as explanatory variable.

Source: author's estimations.