Received: 14 June 2022 | Revised: 6 December 2022 | Accepted: 27 February 2023

DOI: 10.1002/jid.3779

RESEARCH ARTICLE

JOURNAL OF INTERNATIONAL DEVELOPMENT | WILEY

Categorising households based on shock severity experience: The effects of remittances on consumption smoothing post-shock in Nigeria

Lucky Otame

Department of Accounting Finance and Economics (AFE), Bournemouth University Business School (BUBS), Bournemouth University, Poole, UK

Correspondence
Lucky Otame, Department of Accounting Finance and Economics (AFE), Bournemouth University Business School (BUBS), Bournemouth University, Poole, UK.
Email: lotame@bournemouth.ac.uk

Abstract

Existing literature suggests that remittances can help households in developing countries cope with post-shock consumption. Focusing on Nigeria, where remittance receipts reached $25B in 2018 with increasing incidences of shocks, this study puts this claim to the test by categorising households into two: the group that suffered the most severe shock types and the group that suffered less severe shock types. Data is sourced from the World Bank and linearised regression results indicate that remittances benefit households that experienced less severe shocks than households that experienced the most severe shocks in their post-shock consumption. Establishing a discriminatory financial market in favours of shock-affected households is desirable to aid them in coping with post-shock consumption.

KEYWORDS
consumption smoothening, financial market, households, international remittances, shocks

1 | INTRODUCTION

Because of adverse shocks, households in many developing nations, including Nigeria, struggle greatly to manage their consumption (Fafchamps, 2003; White et al., 2001; Zezza & Tasciotti, 2010). Combes and Ebeke (2011) assert that households that are subject to negative shocks deal with a range of problems, including unpredictable consumption and limited access to capital in the traditional financial market. Rapoport and Docquier (2006) demonstrate that

households typically meet limited government or state assistance, which worsen their challenges on how to fund post-shock consumption (de Brauw & Woldehanna, 2013).

The lack of access to finance, inadequate state intervention and increasing shock experiences act as push factors for many families to send members abroad with the aim to remittances. Existing research on the subject show that people see remittances as the ideal way to finance their consumption spending towards recovering from shocks. The remittances–household finance idea has attracted a lot of empirical research on the topic. Dominant findings on the relationship between remittances and the post-shock consumption of households such as Adams (2010), Ambrosius and Cuecuecha (2013), Ambrosius and Cuecuecha (2016) and Ratha (2013) favour remittances as a good source of easing consumption post-shock for households in many developing countries.

In the case of Nigeria, remittances flow to the country has been on the increase, outstripping other capital flows according to the World Bank (2019). This is shown in Figure 1. The bank reports that international remittances flowing to Nigeria in 2018 alone is around $25b. Despite the inflows, remittance-receiving households affected by shocks still struggle to finance consumption arising from shocks, thus indicating that the subject requires more research.

Existing research has revealed the devastating effects of adverse shocks on the welfare of households. For example, Nguyen et al. (2020) used the case of Cambodia to show that most covariate shocks have a detrimental effect on household consumption ability. Using different approaches and focus, other leading empirical works on the subject such as Adams (2010), Pajaron (2017) and Shehu and Sidique (2015) have shown that households can rely on remittances to smooth consumption when faced with negative shocks. Although many of these studies classified households based on some basis, no sufficient distinction was among households in terms of the severity of the shocks they suffered. For example, when grouping is done in terms of household characteristics (e.g. rural or urban, size), the intensity of shock events experienced would be undermined.

This study therefore contributes primarily to the subject by classifying households based on the severity of their shock experiences. The classification allows for determining whether the effects of remittances on post-shock consumption are the same for each category of households and for all households. The classification is based on those who experienced the most traumatic types of shocks (e.g. kidnappings, loss of dwelling place and armed robbery) and those that experienced less traumatic shock types (e.g. price increase, low yield). Thus, classifying households based on the intensity of shocks they have suffered brings a fresh perspective on the dynamics of remittances and the welfare of households in the context a developing country.

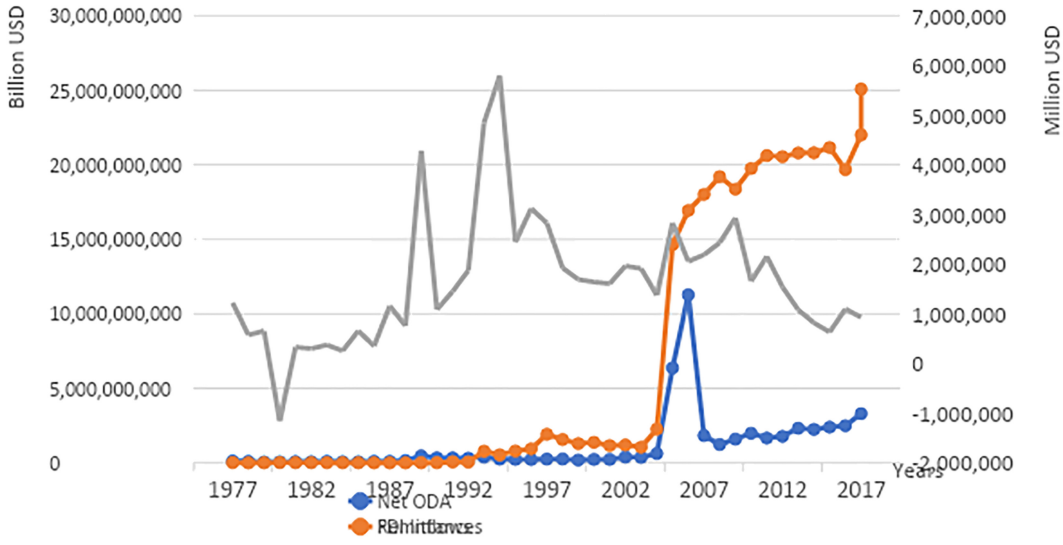


FIGURE 1 Flow of remittances, ODA and FDI to Nigeria 1977–2018. *Source*: *Author's Compilation using data from the World Bank and the Institute for Migration.*

2 | CONCEPTUAL AND THEORETICAL FRAMEWORK

Sending monies by migrants to their home countries from their destinations in a global economy is undoubtedly a complex one. Although there are many theories that attempt to explain the motives behind remittances and the consumption of households in developing countries, the altruistic theory, propounded by Comte (1858), is adopted in this study. The theory provides a valuable framework for understanding the foundation of remittance sending in a global economy where the share of international migrants and remittances has continued to rise and significantly contributes to the finance of low- and medium-income countries (LMICs). Comte has many followers such as Stark (1985) and Stark (1988) that contributed with the tempered altruism hypothesis variant.

According to proponents of the altruism hypothesis, individual family members and households aid each other, explaining migrant remittent decisions (Stark, 1988). According to the idea, migrants will be willing to send resources to compensate for family members' income shortfalls, whether for consumption or investment.

The tenets of the altruism theory make migrants sometimes sacrifice their comfort to satisfy home members left behind. The generous gesture could be a reciprocal sacrifice as household members may have contributed to the emigration of the sending migrant to seek greener pasture. Viewed this way, sending remittances becomes almost obligatory.

Comte believed that humans are morally required to forsake self-interest and live for others, according to followers of the altruistic philosophy (Opong, 2012). When migrants send money back home from abroad for altruistic reasons, Jacques (2022) notes that the worker maximises personal well-being. According to the study, by allocating her revenue between consumption in the country of domicile and the country of origin, household consumption in the land of origin, financial asset acquisition in the country of residence and economic and non-economic purchase of assets (such as housing market) in the native country are maximised. Jacques (2022) believes that 'connection' to one's home country and portfolio diversification could be other reasons for remittances.

2.1 | Shock events

According to Seth (2015), adverse shocks are events that can trigger a reduction in well-being, which can affect individuals (illness, death), a community, a region or even a nation (natural disaster, macroeconomic crisis). Negative shocks events can reduce group or individual well-being, such as illness, unemployment or flooding, which may cause or compound poverty. According to the UNDP, risks factors lead to shock events when they materialise. An economic shock is a risk that causes a 'significant' negative welfare effect on consumption, major income loss or high illness-related costs (Canagarajah et al., 2005). Kozel et al. (2008) refer to shocks as the realisation of different states of the world and consider risks as leading to such completion. The manifestation of risk (as a shock) also leads to undesirable welfare outcomes (Dong et al., 2019). See Ekor et al. (2020) and Springer et al. (2022) that discussed more on the effect the exposure to shocks could have on a household. According to Springer et al., insecurity, climate shocks, infestations, animal sickness, desert insects and the COVID-19 epidemic are examples of the periodic shocks Somali grain and livestock markets face. The shocks examples given by Springer et al., cuts across many developing countries including Nigeria, but with each country's domestic characteristic factored in.

2.2 | Remittances

According to Carling (2008), there are several views in the literature of what constitute remittances. However, they all make a connection between the earnings of migrants in their various locations and their homelands as shown in Pfau and Giang (2009) in the case of Vietnam. The connection between remittances and households was also demonstrated in Spain by the influx of migrants according to Lacuesta (2010). Lubambu (2014) defines remittances

as cross-border, personal, voluntary cash and non-financial (in-kind or social) transfers made by migrants to persons or groups, either singly or in combination with others. The World Bank (2016) defines personal remittances in accordance with a new item in the sixth edition of the Balance of Payments Manual (BPM6). Remittances are amounts paid for private transactions including worker compensation. All financial or social payments, regardless of the sender's source of income, are considered personal remittances (and irrespective of whether the sender receives income from work, business or property, social benefits and any other types of transfers or sales of assets).

Remittances can be beneficial to households when they are put to different use by their recipients such as consumption and profitable business ventures as demonstrated in Salahuddin et al. (2021) to enhance the welfare of households. According Salahuddin et al.'s (2021) report, when applied to businesses by recipients as shown in the case of Bangladesh, remittances can generate revenues, which can improve a household's capacity to withstand financial adversity. Thus, if a sizable amount of the remittances received by households is set aside for savings, it can result in significant economic growth over time.

2.3 | Nature of households shocks in Nigeria

The incidences of adverse shocks have been of grave concern to households and the government in Nigeria. Many families confront various elements of surprise in flooding, communal clashes, criminality and other forms of violence. The Internal Displacement Monitoring Centre (IDMC) Geneva, an agency that monitors situations of displacement caused by conflict and violence, disasters and development globally, reports that conflict and violence led to 248 000 new displacements across 19 of the 37 states (including the FCT) as of 2020. At the same time, the ongoing insurgency in the northeast triggered 105 000 criminal violence in the northwest and 88 000 in the north-central states. The number of communal violence in the central region was 55 000.

Poverty is rising every day; households thus face exceedingly tough times in their consumption baskets while responding to shocks. In 2012, flooding in Nigeria pushed rivers over their banks and submerged hundreds of thousands of acres of farmland. Floods forced 1.3 million people from their homes by mid-October, and 431 lives were lost according to several studies. At the end of 2019, flooding accounted for 157,000 new displacements out of about 2.6 million people displaced in 2019.

The frequent occurrence of shocks among households, coupled with a lack of effective shock coping mechanisms in the region, has made many homes vulnerable to poverty (Abimbola, 2015; Jette-Nantel et al., 2010; Osarfo et al., 2016; Shehu & Sidique, 2015). Some of the characteristics of households in Nigeria include that they possess little or restricted access to social safety nets and cannot access formal credit necessary to mitigate the consequences of severe challenges arising from shocks and associated risks. Thus, those receiving remittances see it as cushioning towards recovery. Hence, many households are motivated to sponsor at least a member of their home abroad. Given the frequency of shocks in the country, the government finds it challenging to provide adequate safety nets for families.

Hence, using remittances to hedge against future shocks has increasingly become one of the reasons behind households' decision to sponsor or send at least a member of their family abroad. The role of remittances may have contributed to Nigeria being the largest recipient of personal remittances in sub-Saharan Africa (SSA) WorldBank (2019). Additionally, the country is the most populated region, where households are experiencing diverse kinds of shocks due to various levels and forms of violence. Thus, a detailed analysis of remittances on the shock-coping abilities of homes is required to formulate and devise social intervention strategies necessary to assist families in their coping measures. Increases in remittances on the one hand and negative shock experiences on the other thus present a desirable choice for a study.

2.4 | Risk factors to shocks and migration trend in Nigeria

Risks are a central part of life for households in low-income countries Bonfrer and Gustafsson-Wright (2017). Some risk factors that potentially lead to household shock events are numerous and could be man-made or natural in

Nigeria. While several artificial factors are shock causing agents apart from natural causes in Nigeria, the connections between the above-developed risk factors are multifaceted. For example, according to Morrissey (2020) and Yunus and Saddam (2021), the prevailing explanations for the rise of religious extremism and, subsequently, terrorism in Nigeria focused on socio-economic inequalities of poverty and subjective reinterpretation of religious ideologies and Marxist-inspired manipulations. They contend that the fear of 'domination' or de-establishment by religious majorities in Nigeria has led to the upsurge of violent religious movements or religious extremism that have gradually metamorphosed into a form of terrorism. See also Emerson et al. (2009), who contend that 'the fear of being deprived of something drives one to act aggressively, while the fear of being left outdrives the movements against prevalent forces'.

Tribal conflicts and rivalries among the various ethnic and tribal groups are another underlying risk factor leading to household shocks. As early as the 1980s, Kóczán and Loyola (2021) analysed the settlement and migration pattern of the pastoral Fulani in Nigeria and Cameroon and argued that conflicts among pastoralists and their neighbours are increasing in frequency and intensity. According to Invention and Bibi (2015), past conflicts were due to the overlap of farmlands with cattle routes. Farmers grow crops on the roads of herders, resulting in clashes. These clashes have now escalated, taking another dimension of ethnic and religious differences with little effort from government or community leaders to address them.

This trend has continued in recent times, as evidenced in the more grievous farmers–herders clashes while competing for available agricultural farmlands that have led to the loss of lives, property and displacement of households in North-east Nigeria. For example, the international crisis group Africa report 2018 finds that more than 1300 Nigerians have died in violence involving herders and farmers. The once spontaneous attacks have become premeditated scorched-earth campaigns in which marauders often take villages by surprise at night. Apart from death and displacements because of this kind of shock, many other households have lost their sources of income, maimed, and become more vulnerable to ill health and poverty with little or no access to social security. These incidences of shocks have triggered increased out-migration by household members from the country as shown below using the net migration rate of the country.

Net annual migration rate is taken to be the difference between the total number of immigrants to the country and the total number of emigrants from the country, which includes both citizens and non-citizens. Table 1 indicates a positive net annual migration rate for the country between 2000 (10.33%) and 2008 (7.73%) largely accounted for by free intra-regional movements and relative peace and security enjoyed in Nigeria. However, from the year 2009, which coincides with the global economic crisis and increasing insurgency and communal clashes, there was a sharp turn of the rate from 7.73 in 2008 to a negative value of −2.48 in 2009 and has remained negative till 2022. The increase in more people leaving the country may have been fuelled by the increasing level of shocks in the country, which, in addition to other economics factors such as unemployment, act as push factors for people to migrate while opportunities in destination countries act as pull factors to destinations. This may partly explain while remittances to the region have also been on the increase as reported by the World Bank, notwithstanding that the stock of migrants does not necessarily explain the sending and receiving of remittances.

With the shock events being on the increase in Nigeria, the fundamental concern of households affected by shocks (e.g. displacements and loss of source of income) is how to smooth consumption. Given the inability of the government to provide adequate safety nets for households in the region, many households rely on the receipts of remittances to fund their consumption. The permanent income hypothesis (PIH) is used as a basis to explain the link between such remittance's receipts and post-shock consumption of households affected by shocks. Hence, the PIH is briefly discussed below.

2.5 | The PIH of consumption

While various indicators are available for performing welfare analysis, economists long favoured consumption as a proxy for living standards (Natali, 2012; Neubourg, 2014; Wilcox, 1989). In its most general form, a consumption

TABLE 1 Nigeria net migration rate 2000–2022.

Year end	Per 1000 population	Annual% change
2000	−0.203	10.33
2001	−0.222	9.36
2002	−0.241	8.56
2003	−0.26	7.88
2004	−0.289	11.15
2005	−0.318	10.03
2006	−0.346	8.81
2007	−0.375	8.38
2008	−0.404	7.73
2009	−0.394	−2.48
2010	−0.384	−2.54
2011	−0.373	−2.86
2012	−0.363	−2.68
2013	−0.353	−2.75
2014	−0.344	−2.55
2015	−0.336	−2.33
2016	−0.327	−2.68
2017	−0.319	−2.45
2018	−0.31	−2.82
2019	−0.303	−2.26
2020	−0.295	−2.64
2021	−0.288	−2.37
2022	−0.28	−2.78

Data Source: United Nations World Population Prospects 2022.

function (Y) links consumption to a range of factors (X), where both can be vectors (Borowiecki & Navarrete, 2018; Kim Bao et al., 2013). They show that consumption expenditure is the most common and preferred welfare indicator but observe that its measurement is a challenging and time-consuming task. Over time, different theories have attempted what constitutes a more objective measurement of household consumption as part of welfare. One of them is the PIH propounded by Friedman (1957), which have been adopted as this study's framework.

According to Friedman, what determines consumption is the expected long-term income (earned from human and non-human wealth) rather than the current income level. Friedman referred to this as average long-run income as permanent income based on which people make their consumption plans. Friedman defines income earned from human wealth as human capital, which refers to the return derived from selling the labour services of a household, known as labour income. He described intangible assets such as savings and equities as non-human wealth. He also points out that in addition to permanent income, an individual or household's income may contain a transitory component he refers to as transitory income, which he describes as temporary that may not continue in future periods.

We aim to test the efficacy of remittances on the post-shock consumption of the two categories of households to other sources identified in the available data. Considering the information and variables constructed for this study, we deem the PIH more appropriate than other frameworks. We view remittances as transitory income and not permanent income. The study is, therefore, within the framework of the PIH model.

To test the implication of remittances on household consumption, we specify the household utility function as

$$U = EU(C) \tag{1}$$

We denote expected utility by U.

C represents the level of household consumption by substituting U with expected utility. We have incorporated uncertainty into the model. Each rational household aims to maximise the sum of expected utility, constrained by the sum of initial assets and the value of their future savings or exogenous income over their lifetime. The theory assumed that each household could save or borrow money at a given rate of interest to meet the consumption expenditure of his family with the condition that he must pay the money before the end of his lifetime. If we assume the interest rate to be zero, the budget constraint of the household will be

$$Ct < Ao + Yt \tag{2}$$

The marginal utility of consumption is always positive for consumers, and the budget constraint will be satisfied by each household with equality. Maximising the utility of homes requires that the Lagrangian function of each home be

$$L = U(Ct + y(Ao + Yt - Ct) \tag{3}$$

The first-order condition for the utility to be maximised concerning C_t is

$$Ct = \frac{\partial u}{\partial ct} = y \tag{4}$$

Equation (4) incorporates uncertainty into the model. Each rational household aims to maximise the sum of expected utility, constrained by the sum of initial assets and the value of their future savings or exogenous income over their lifetime. The theory assumed that each household could save or borrow money at a given rate of interest to meet the consumption expenditure of his family with the condition that he must pay the money before the end of his lifetime.

3 | DATA AND METHOD

This analysis employs data from the World Bank's 2018/2019 General Household Survey (GHS) for Nigeria. The survey is conducted every 2 years in a series of waves. The survey defines a household as a group of individuals who typically eat together and sleep in the same place. Examples of a household include those made up of a man, his wife or wives, children, parents, a nephew and other extended friends or family members.

In the survey, households that experienced shocks responded to several questions on the measures they adopted in coping with consumption after they experienced negative shocks. The variables used in this analysis have been generated from the responses provided by the respondents based on the research question. Their responses reported the value of remittances they received at international and domestic levels. Respondents also included the income they derived from employment and other sources that they relied upon to cope with consumption in the aftermaths of shocks. Coping measures reported by households include selling-off property, reliance on savings, receipts of regular stipends received from friends and associates, as well as receiving remittances from migrants' household members and friends abroad among other sources. These have been used in building the study's model construct.

In addition, respondents rated the level of the severity of their shock experiences based on their shock history from Waves 2 to 4 of the survey series. The first wave in the series comprises data from the 2011/2012 survey, followed by Wave 3 data from 2015/2016 and Wave 4 data from 2018/2019, which forms the most recent dataset used in this analysis. They classified the intensity of shocks into three: most severe, more severe and severe. I have used the responses to the severity questions to categorise households into those that suffered the most devastating

type of shock experiences and those that experienced less-devastating shock experiences. Price increases, death of someone who sends remittances, non-farm business failure, loss of property (assets) and loss of income are economic shocks in our classification. Kidnapping and armed robbery, damage to or destruction of a dwelling house and destruction of harvest by fire are social shocks.

In the survey 2018/2019 GHS, 2346 out of 3870 responded to haven suffered at least a form of shock. In the 2346 households that agreed to have experienced shocks, 1429 claimed to have experienced most severe shocks as defined in the survey, while 917 families responded to have suffered less severe shocks (made up of more severe and severe shocks), as shown in Table A1.

3.1 | Variables and data cleaning

Presented in Tables A3 and A4 is the paired *t*-test highlighting some of the dependent and independent variables generated for this study. The tables class households in terms of the negative socio-economic shocks they have suffered over the years. It shows that the proportion of households that experienced the most severe shocks can be read off as approximately 61% (1429/2346*100), while those that experienced other shocks are about 39% (917/2346*100). Rather than categorising households based on their poverty status or geography or using discrete variables to measure micro shock as dominant in existing studies, this analysis categorises households based on the severity of their shock experiences. It then uses historical data on a household's consumption expenditure as a continuous measure of shock, thus adding to the existing literature on the subject.

I carefully generated variables from the survey's relevant Stata files to reflect household factors known to affect post-shock consumption to meet the study's purpose (household size, education, number of dependants, location). I divided household coping mechanisms into external and domestic coping measures. International remittances (cash transfers and gifts) are external coping measures. In contrast, domestic ones include domestic remittances, labour hours, employment income and savings controlling for rural and north-central Nigeria, which assume one (1) and zero (0). I merged more severe and severe shocks into one category on based on the point data availability in the survey, resulting in only two household categories.

The variable of interest is post-shock average household consumption expenditure. Consumption expenditure is undoubtedly the best measure of household welfare, as demonstrated in the studies of introductory part of this chapter. The explanatory variables include international remittances (made up of cash and gifts) and domestic remittances. These variables have been selected based on the findings of previous studies such as such as Deaton and Grosh (1998) and Natali (2012) that households experiencing shocks can rely on remittances as a coping measure. Other post-shock explanatory variables include savings, employment income, sale of livestock, labour hours, reliance on savings, the proportion of household dependents and other household characteristics as previously defined.

The functional form of a model is of importance. Hence, I descriptively examined the relationship between the variable of interest and some of the key explanatory variables, such as international remittances. Figure 2 shows a scatter plot between consumption expenditure and remittances on the left pane of the scatter plot and between consumption and property selling on the right pane. The graphs show a positive linear relationship between consumption and remittances and a positive linear association between remittances and sold property. The upward-sloping curves indicate an incremental positive relationship of consumption expenditure as more remittances tend to be received by households. However, fitting an imaginary line through the consumption/remittance observation points shows that some observation points are farther away from the line fit, indicating a case of extreme values. The observation sites in the consumption-sold property plot display a similar pattern, with fewer observation points located not too far away.

The summary statistics, as shown in Table A1, reveal some interesting information about the variables. It shows that average household consumption spending has a mean of 2074 and a maximum value of 118 282, with some household members reporting nothing. The disparity between the extreme values could indicate that households

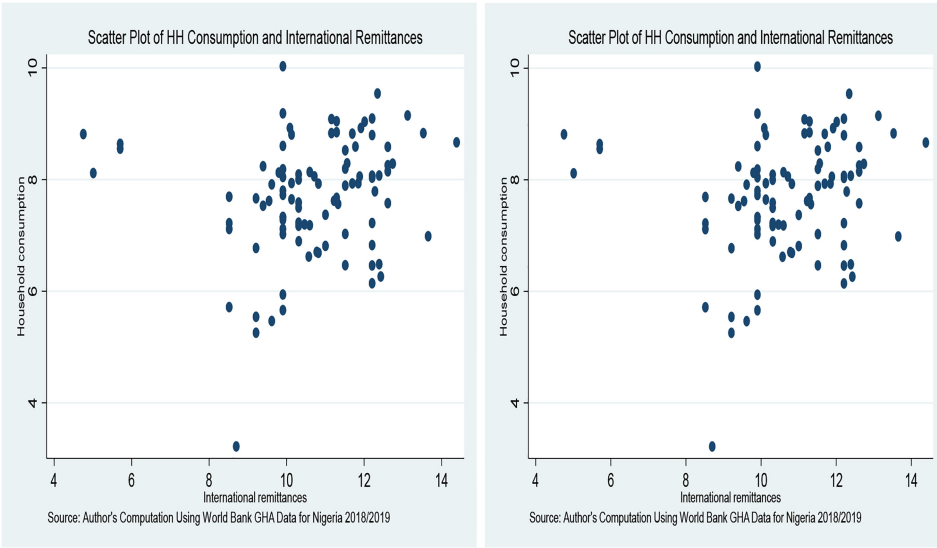


FIGURE 2 Scatter plot of consumption and remittances/consumption and sold property. *Source*: Author's computation.

cannot finance consumption due to shock interruptions and for other reasons. Households probably go hungry or rely on charity to feed them. Total remittances have a high value of 1 770 000, a mean of 4907 and a minimum of zero, demonstrating that some households do not get overseas remittances. Total domestic remittances display a similar pattern having a mean value of 20 292 and a maximum of 1 800 000. Compared with international remittances' mean value of 2074 and a maximum of 1 770 000, households receive more domestic remittances than foreign remittances.

3.2 | Specification of the model

Equation (5) identifies the vectors of explanatory variables that capture post-shock coping strategies on the average consumption expenditure.

$$InC| = \beta o + \beta_1 IDR_j + \beta_2 DCM_i + \beta_3 HC_i + \beta_4 LC_{ci} + e \tag{5}$$

where

lnCj stands for per-person equivalent household consumption expenditure, a household well-being measure. According to Deaton and Grosh (1998), consumption is the best indicator of household economic well-being because of the high frequency of recording it with mistakes and errors than household income, and households attempt to stabilise their consumption over time.

IDRj denotes evidence of household international remittance receipts recorded in the survey. Remittance receipts comprise cash and gift sent to Nigerian household members by migrants and other associates from overseas.

DCM denotes domestic coping measures of household *i*th consumption related to the sale of physical assets such as land property and livestock, reliance on savings, profits, Internet access and utilisation and receiving assistance from friends and family members locally.

HCi represents the characteristics of the *i*th household, including household size, income, savings and expenditure on education of household members that influence a household's economic well-being. It captures the endowments of the family, which measure the extent of a household's productive capacity and serves as a proxy for permanent income.

LCci stands for locational characteristics. Household location (rural or urban) and north central are examples of such variables. Unobserved locational effects control for the model using an explicit description of the locational characteristics. Endogeneity could lead to underestimating the full impact of covariate shocks on household economic well-being. A description of the household characteristics (HC) also decreases the risk of unobserved household heterogeneity, causing bias.

In its general form, the OLS estimation technique is as follows:

$$Y = \beta_0 + \Sigma_{j=1\ldots p}\ \beta_j X_j + \varepsilon \tag{6}$$

where

Y is the dependent variable;

β_0 is the intercept of the model;

X_j corresponds to the *j*th explanatory variable of the model (j = 1 … ..... …p); and

E is the random error with expectation σ and variance σ^2.

To specify our model and to account for the condition of normality of OLS assumption and assume the suitable functional form, the log-transformed equation (6) produces Equation (7).

$$\begin{aligned} \text{logConexp} = \ & \beta_0 + \beta_1 \text{logtotalrem} + \beta_2 \text{logdomrem} + \beta_3 \text{logprofits} + \beta_4 \text{gempincome} \\ & + \beta_5 \text{logeduexp} + \beta_6 \text{logsoldprop} + \beta_7 \text{logsavings} + \beta_8 \text{logassfrdfam} \\ & + \beta_9 \text{agehhead} + \beta_{10} \text{readwrite} + \beta_{11} \text{labhrs} + \beta_{12} \text{hhsize} + \beta_{13} \text{rsector} \\ & + \beta_{14} \text{nortcentral} + \mu \end{aligned} \tag{7}$$

The βs are the parameters to be estimated. After transforming the dependent variable, it fulfils the normality assumption of OLS.

4 | RESULTS

4.1 | Descriptive statistics and linearised regression

The proportion of families that suffered more severe shock types compared to families that suffered shocks of lesser magnitude are shown in terms of the intensity of shock suffered in Table A1 in the appendix. The table shows that 1429 households experienced most devastating shock types such as kidnappings, loss of dwelling place and loss of a household head, while 917 households experienced shocks of relatively lesser magnitudes such as low farm yield, illness of short duration and inability to find a job as shown in the survey.

4.2 | Test of hypothesis

To determine whether there is any difference between the means of the two groups (i.e. households that suffered the most devastating shock experiences and the households that experienced shocks of lesser magnitudes), it was hypothesized that *there is no difference between the means of the two groups*. In other words, the hypothesis that there is no difference in their means at the 5% significance level (α = 0.05) was tested.

Symbolically, this is stated as

$$H_o : \mu d = 0 \tag{8}$$

while the alternative hypothesis

$$H_a : \mu d \; ! = 0 \tag{9}$$

Equation (8) can be restated as: mean diff = Mean(a) − Mean(b) = 0

where

Mean(a) = Mean of households that experienced the most severe shock types and Mean(b) = mean of households that experienced less severe shock types. To conduct the test, I first generate a variable for the hypothesised difference in mean. I call this variable 'diff' and then perform a paired *t*-test, as shown in Table A2. This is repeated for all the variables in Table A3.

The paired mean comparison test indicates a statistically significant difference between the means of the two groups. That is to say that the post-shock consumption coping measures of the two groups using international remittances are significantly different. There were no sufficient reasons to accept the null hypothesis but to accept the alternative hypothesis that the means of the two groups are different. The significant *t* statistic of 10.8099 with *Pr* (*T* > *t*) = 0.000 indicates that there is indeed a difference in the post-shock consumption coping measures using remittances between households that experienced the most devastating types of shock disruptions and homes that experienced lesser degrees of shocks.

4.3 | Discussion of regression of results

The explanatory variables were regressed on the log of per household consumption expenditure, the variable of interest as shown in Table A5. The results reveal that the overall model fit is moderately positive, with an R^2 of 0.26 for all homes, 0.25 for the most severely affected households and a higher rate of 0.29 for families that suffered less severe shocks. However, the study's interest lies more in the regressors' coefficients and their relation to average household consumption expenditure than the overall fit. To this end, total overseas remittances are large and favourable to post-shock household consumption and returns significant at the 1% level for all families, at 5% for households who experienced less devastating shock events and only at the 10% level for homes that experienced the most devastating shock events. The result indicates further that a 1% (percentage) change in remittances results in a corresponding change in consumption for all households (0.0258) and the most severely impacted homes (0.0212). A percentage shift in foreign remittances would cause a 0.03% change in household spending for households who have experienced fewer shocks. The result provides evidence that when the degree of shock experienced by a home is less severe, the influence of remittances on post-shock consumption is more remarkable. Nonetheless, it has calming effects on households that have experienced more brutal shocks while trying to cope with consumption.

Profits from non-income-generating activities such as trading and artisanship are significant across the board. A percentage point increase in profits can equal a one-percentage-point increase in the log of average household consumption: 0.0265 for all households; 0.0259 for the most severe homes; and 0.0270 for the less severely affected households. The significance of profit from non-farm business activities across the board shows the relevance of earnings as a source of funding household post-shock consumption. As expected, education expenses hurt all households' post-shock consumption coping strategies. The degree of negative impact, on the other hand, is higher for all families, particularly those that have experienced the most severe sorts of shocks. Selling off property by households to cope with consumption due to shocks returned insignificant. This could be to the fact that most sales of property are made at their break-up (forced) values, and funds realised from such sales are known to be far less than their actual market values. Finding buyers in the middle of a crisis is also another factor.

The family's post-shock consumption coping is inversely related to the age of a household's head. This is interpreted to mean that as a household advances in age, his ability to fend for the home became weaker and weaker due to age and within a crisis.

Rural households suffer more, with as much as (36%–42%) dealing with consumption post-shock than their urban counterparts. The implication might be that staying in the rural area puts a family's consumption more at risk because extra shock could cause a drop in consumption equal to the mentioned amounts.

5 | CONCLUSION AND RECOMMENDATION

According to the study's findings, using domestic resources such as profits from commercial activities to smooth post-shock consumption rather than relying on international remittances is much more effective for households. However, when remittances are used as a coping strategy, the group of households that suffered the less severe shock types benefit more compared to the group that experienced more catastrophic shocks. The relative low effectiveness of remittances as a coping measure compared to profits could be the result of several factors. These factors could include the amount and the regularity of remittances received by households and migrant workers who usually transmit remittances being unable to send remittances owing to unforeseen events at destination, among other things. While profits have returned from the analysis as the most significant measure in a households' post-shock consumption, to make profit from a business, however, requires access to affordable finance. Access to finance in the region by households within the domestic financial system is characterised by a huge exclusion due to several factors such as illiteracy and unemployment, among other factors.

The findings point to the failure of the existing financial system to make financing accessible to willing households and the inability of the government to create a violent-free environment that enables a business to thrive as grave hindrances in this regard. The results therefore have some policy implications. If proven households that have experienced shocks can affordably access finance for trade, they are more likely to alleviate the effects of the shocks by consuming the gains created by trading.

Therefore, it is proposed that developing a discriminating finance market that divides households into groups of shock-affected and no-shock-affected households and favours the shock affected would assist to ease the challenges faced by households in managing post-shock consumption. A market like this would make it possible for households harmed by shocks to obtain financing at almost no cost, which they might utilise to fund profitable ventures, and this could be a part in addressing the issue of poor institutions and a drive towards realising sustainable development goals of poor countries (Ordonez-Ponce & Talbot, 2023). The development of a savings awareness campaign is also recommended to inform households of the importance of setting aside some of the remittances they get during times of low or no shock so that they can use those funds to finance consumption and non-farm businesses during a crisis when it strikes. Profits from the revenues of these firms can improve a family's capacity to withstand financial adversity; thus, if a sizable amount of the remittance is set aside for savings, it can result in significant economic growth over time, as demonstrated in Salahuddin et al. (2021) in the case of Bangladesh.

CONFLICT OF INTEREST STATEMENT

There is no conflict of interest to disclose.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available in World Bank at https://microdata.worldbank.org/index.php/home.

ORCID


Lucky Otame https://orcid.org/0000-0002-5827-8668

REFERENCES

Abimbola, O. A. (2015). Vulnerability and poverty transitions survey, 2009, first round - Report poverty transitions in rural south west Nigeria. Web server without geographic relation, Web server without geographic relation (org): Sci-GaIA Open Access Repository.

Adams, Jr, A. H. A. C. (2010). The economic impact of international remittances on poverty and household consumption and investment in Indonesia. The World Bank East Asia and Pacific Region & Development Economics Department Development Prospects Group.

Ambrosius, C., & Cuecuecha, A. (2013). Are remittances a substitute for credit? Carrying the financial burden of health shocks in national and transnational households. *World Development*, *46*, 143–152. https://doi.org/10.1016/j.worlddev.2013.01.032

Ambrosius, C., & Cuecuecha, A. (2016). Remittances and the use of formal and informal financial services. *World Development*, *77*, 80–98. https://doi.org/10.1016/j.worlddev.2015.08.010

Bonfrer, I., & Gustafsson-Wright, E. (2017). Health shocks, coping strategies and foregone healthcare among agricultural households in Kenya. *Global Public Health*, *12*(11), 1369–1390. https://doi.org/10.1080/17441692.2015.1130847

Borowiecki, K. J., & Navarrete, T. (2018). Fiscal and economic aspects of book consumption in the European Union. $2.

Canagarajah, P. S., Siegel, P. B., & Heitzmann, K. (2005). Guidelines for assessing the sources of risk and vulnerability. Web server without geographic relation, Web server without geographic relation (org).

Carling, J. (2008). The determinants of migrant remittances. *Oxford Review of Economic Policy*, *24*(3), 581–598. http://www.jstor.org/stable/23606904

Combes, J. L., & Ebeke, C. (2011). Remittances and household consumption instability in developing countries. *World Development*, *39*(7), 1076–1089.

Comte, A. (1858). *The positive philosophy of Auguste Comte*. Blanchard.

Deaton, A., & Grosh, M. (1998). Consumption. Designing household survey questionnaires for developing countries: Lessons from ten years of LSMS experience.

de Brauw, M. A. V., & Woldehanna, T. (2013). Motives to remit: Evidence from tracked internal migrants in Ethiopia. *World Development*, *50*, 13–23.

Dong, Y., Zhao, J., Wang, L., Wang, H., Zou, X., & Zhang, J. (2019). Effect of bisphenol A and pentachlorophenol on different enzymes of activated sludge. *Science of the Total Environment*, *671*, 1170–1178. https://doi.org/10.1016/j.scitotenv.2019.03.455

Ekor, M., Damisah, O., & Kefas, T. (2020). An evaluation of social sector budgeting in Sokoto state, Nigeria. Germany, Europe.

Emerson, M., Kausch, K., Youngs, R., Abdel-Latif, O., Asseburg, M., Çakir, R., Düzgit, S. A., Echagüe, A., Al-Hashimi, K., & el Houdaiby, I. (2009). *Islamist radicalisation: The challenge for Euro-Mediterranean relations*. Centre for European Policy Studies.

Fafchamps, M. (2003). *Rural poverty, risk and development* (Vol. 144). Edward Elgar Publishing. https://doi.org/10.4337/9781781950685

Friedman, M. (1957). The permanent income hypothesis. In *A theory of the consumption function* (pp. 20–37). Princeton University Press. https://doi.org/10.1515/9780691188485-005

Invention, J., & Bibi, I. M. A. B. I. U. M. (2015). An assessment of farmer-pastoralist conflict in Nigeria using GIS. Web server without geographic relation, Web server without geographic relation (org): Figshare.

Jacques, B. H. (2022). A theory of workers' remittances with an application to Morocco. Web server without geographic relation, Web server without geographic relation (org).

Jette-Nantel, S., Freshwater, D., Beaulieu, M. S., & Katchova, A. L. (2010). Farm income variability and off-farm diversification in Canadian agriculture. United States, North America.

Kim Bao, G., Hoang Van, M., & Allebeck, P. (2013). Alcohol consumption and household expenditure on alcohol in a rural district in Vietnam. *Global Health Action*, *6*, 1–8. https://doi.org/10.3402/gha.v6i0.18937

Kóczán, Z., & Loyola, F. (2021). How do migration and remittances affect inequality? A case study of Mexico. *Journal of International Development*, *33*(2), 360–381. https://doi.org/10.1002/jid.3526

Kozel, V., Fallavier, P., & Badiani, R. (2008). Risk and vulnerability analysis in world bank analytic work. Soc. Prot. Discuss. Paper. World Bank, 68.

Lacuesta, A. (2010). A revision of the self-selection of migrants using returning migrant's earnings. *Annals of Economics and Statistics*, *97/98*, 235–259. https://doi.org/10.2307/41219117

Lubambu, K. M. K. (2014). The impact of remittances on developing countries.

Morrissey, F. (2020). A system of life: Mawdudi and the ideologisation of Islam. *Asian Affairs*, *51*(2), 401–404. https://doi.org/10.1080/03068374.2020.1747850

Natali, M. A. (2012). Measuring household welfare; short versus long consumption modules. United States, Web server without geographic relation (org): United Nations Publications.

Neubourg, N. A. (2014). A tale of two short consumption modules; household welfare measurement in Bangladesh. United States, Web server without geographic relation (org): United Nations Publications.

Nguyen, T.-T., Nguyen, T. T., & Grote, U. (2020). Multiple shocks and households' choice of coping strategies in rural Cambodia. *Ecological Economics*, *167*, 106442. https://doi.org/10.1016/j.ecolecon.2019.106442

Opong, K. K. (2012). Prospect theory and migrant remittance decision making. Adam Smith Business School [online]. Retrieved October 12, 2022.

Ordonez-Ponce, E., & Talbot, D. (2023). Multinational enterprises' sustainability practices and focus on developing countries: Contributions and unexpected results of SDG implementation. *Journal of International Development*, *35*(2), 201–232. https://doi.org/10.1002/jid.3682

Osarfo, D., Senadza, B., & Nketiah-Amponsah, E. (2016). The impact of nonfarm activities on rural farm household income and food security in the upper east and upper west regions of Ghana. *Theoretical Economics Letters*, *06*(03), 388–400; ISSN 2162-2078 2162-2086. https://doi.org/10.4236/tel.2016.63043

Pajaron, M. C. (2017). The role of remittances as a risk-coping mechanism: Evidence from agricultural households in rural Philippines. *Asian and Pacific Migration Journal*, *26*(1), 3–30.

Pfau, W. D., & Giang, L. T. (2009). Determinants and impacts of international remittances on household welfare in Vietnam. *International Social Science Journal*, *60*(197–198), 431–443. https://doi.org/10.1111/j.1468-2451.2010.01733.x

Rapoport, H., & Docquier, F. (2006). The Economics of Migrants? Remittances, IZA Discussion Papers, No. 1531. Institute for the Study of Labor (IZA).

Ratha, D. (2013). The impact of remittances on economic growth and poverty reduction. *Policy Brief*, *8*(1), 1–13.

Salahuddin, S., Masud, M. M., & Teng, K. K. (2021). Remittances and households' savings behaviour in Bangladesh. *Society and Business Review*, *17*, 120–140. https://doi.org/10.1108/SBR-08-2020-0104

Seth, A. E. A. (2015) Remittances -Towards human resilience: Sustaining MDG progress in an age of economic uncertainty. *Oxford Economics* [online].

Shehu, A., & Sidique, S. F. (2015). The effect of shocks on household consumption in rural Nigeria. *The Journal of Developing Areas*, *49*(3), 353–364. https://doi.org/10.1353/jda.2015.0163

Springer, J., Slaybaugh-Mitchell, T., Adan, G., & Bean de Hernandez, A. (2022). Comparative resilience of Somali grain and livestock market systems. *Enterprise Development & Microfinance*, *33*(1), 12–27. https://doi.org/10.3362/1755-1986.21-00039

Stark, O. (1985). Motivations to remit: Evidence from Botswana. *Journal of Political Economy*, *93*(5), 901–918.

Stark, O. (1988). Migration, remittances, and the family. *Economic Development and Cultural Change*, *36*(3), 465–481.

White, H., Killick, T., & Kayizzi-Mugerwa, S. (2001). *African poverty at the millennium: Causes, complexities, and challenges*. World Bank Publications. https://doi.org/10.1596/0-8213-4867-1

Wilcox, D. W. (1989). Social security benefits, consumption expenditure, and the life cycle hypothesis. *Journal of Political Economy*, *97*(2), 288–304. https://doi.org/10.1086/261604

World Bank. (2016). *Migration and Remittances Factbook 2016* (Third ed. [book]. Web server without geographic relation, Web server without geographic relation (org)). World Bank. https://doi.org/10.1596/978-1-4648-0319-2

World Bank. (2019). *The World Bank annual report 2019; Rapport annuel 2019 de la Banque mondiale; Informe anual 2019 del Banco Mundial* [book]. Web server without geographic relation, Web server without geographic relation (org). World Bank.

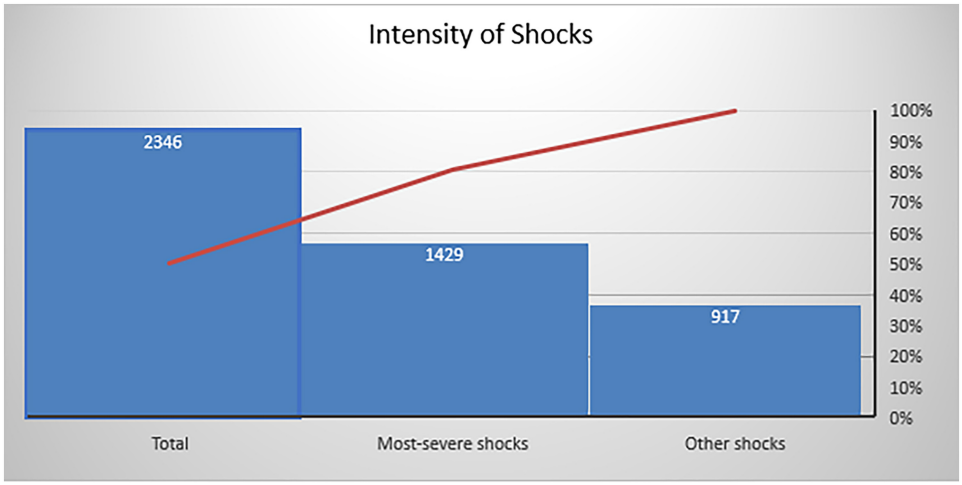
Yunus, J. H., & Saddam, A. (2021). The negative impact of religious extremism on Muslims, Northern Nigeria a case study. *International Journal of Advanced Research*, *9*, 239–243. https://doi.org/10.21474/IJAR01/12439

Zezza, A., & Tasciotti, L. (2010). Urban agriculture, poverty, and food security: Empirical evidence from a sample of developing countries. *Food Policy*, *35*(4), 265–273. https://doi.org/10.1016/j.foodpol.2010.04.007

How to cite this article: Otame, L. (2023). Categorising households based on shock severity experience: The effects of remittances on consumption smoothing post-shock in Nigeria. *Journal of International Development*, *35*(8), 2535–2551. https://doi.org/10.1002/jid.3779

APPENDIX A

TABLE A1. Intensity of shocks among households by severity.



Source: Author's computation using data from the 2018/2019 household survey for Nigeria.

TABLE A2 Summary statistics.

Variable	Obs.	Mean	Std. dev.	Min	Max
Dependent					
Avg. HH consumption exp	2345	2073.47	3171.482	0	111281.8
Independent					
Total Int remittances	2345	4907.022	50429.37	0	1770000
Total domestic remittances	2345	20291.56	79778.22	0	1800000
Profits	2345	20805.91	56001.17	0	1360000
Income from employment	2345	11570.19	39389.29	0	642000
Education expenses	2345	10464.56	66861.38	0	2636000
Sold property	2345	4546.664	17973.42	0	276730
Friends and family	2345	12228.73	40225.86	0	1255870
Age of HH head	2345	50.41365	15.30167	17	99
Relying on savings	2345	0.089979	0.374083	0	5
Ability to read and write	2345	3.368443	2.645563	0	27
Labour hours	2345	10.85075	23.88114	0	203
Household size	2345	5.440512	3.401086	1	29
Rural sector	2345	0.724947	0.446636	0	1
North-central zone	2345	0.159062	0.365812	0	1

Source: Author's computation using World Bank GHS survey data for Nigeria 2018/2019.

TABLE A3 Mean comparison (paired) *t*-test for the categories mostsev. and less_sev.

Paired *t*-test						
Variable	**Obs.**	**Mean**	**Std. err.**	**Std. dev.**	**95% conf. interval**	
mostsev	2345	0.6089552	0.0100792	0.488089	0.58919	0.6287203
less_sev	2345	0.3910448	0.0100792	0.488089	0.37128	0.4108099
diff	2345	0.2179104	0.0201584	0.976177	0.17838	0.2574407
mean (diff) = mean (mostsev − less_sev)					**t** = 10.8099	
Ho: mean (diff) = 0			Degree of freedom = 2344			
Ha: mean (diff) < 0 **Ha**: mean (diff)! = 0					**Ha**: mean (diff) > 0	
Pr (T < t) = 1.0000 Pr (T > t) = 0.0000					Pr (T > t) = 0.0000	

Source: World Bank GHS Survey for Nigeria 2018/2019.

TABLE A4 Paired *t*-test for all variables.

Variable	Unit of measurement	All Households		Households with the most severe shocks (61%)		Households with other shocks (39%)		*T*-test (means difference)
		Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	
Household consumption expenditure	Naira	8.555	1.019	8.504	1.074	8.634	0.92	0.1302***
Total int. remittances	Naira	4078	34 616	4738	37 000	3052	30 526	−169
Int. gift remittances	Naira	829	31 199	230	4583	1760	49 565	1529**
Dom gift remittances	Naira	3770	41 847	3941	51 953	3504	16 622	−437***
Trading profits	Naira	20 542	56 347	19 834	48 417	21 645	66 871	1811***
Regular stipends	Naira	25 743	244 591	26 969	296 718	23 835	126 200	−3134
Sold livestock (%)	Count	0.027	0.153	0.037	0.189	0.01	0.064	−0.03***
Labour hours	Count	564.2	1241.8	607.1	1279.2	497.4	1178.9	−109.7***
Read and write	Count	3.368	2.646	3.232	2.519	3.581	2.82	0.35***
Employment income	Naira	3292	22 392	4176	27083	1915	11 716	−2261***
Friends/Family (%)	Count	0.1	0.261	0.108	0.298	0.086	0.188	−0.02***
Rely on savings (%)	Count	0.003	0.013	0.003	0.013	0.004	0.013	0.001***
Household size	Count	5.439	3.402	5.239	3.305	5.749	3.402	0.51***
Rural Sector	0/1	0.72	0.45	0.7	0.46	0.76	0.43	0.05***
North-Central Zone	0/1	0.16	0.37	0.14	0.35	0.19	0.39	0.05***

Source: Author's computation using World Bank GHS survey data for Nigeria 2018/2019.

*, ** and *** denote 10%, 5% and 1% significance levels.

TABLE A5 Regression result on the log of average household consumption expenditure.

	All households	Households severely affected by shocks	Households less affected by shocks
Variables	Log of avg. household consumption expenditure		
Inter. remittances	0.0258***	0.0212*	0.0297**
	(0.0089)	(0.0113)	(0.0147)
Domestic remittances	0.0115***	0.00497	0.0219***
	(0.0040)	(0.0053)	(0.0060)
Profits	0.0265***	0.0259***	0.0270***
	(0.0041)	(0.0054)	(0.0063)
Employment income	0.0234***	0.0102	0.0501***
	(0.0085)	(0.0107)	(0.0139)
Education expenses	−0.0157***	−0.0186***	−0.0109
	(0.0051)	(0.0068)	(0.0075)
Sold property	0.00865	0.0018	0.00942
	(0.0059)	(0.0093)	(0.0078)
Ass from friends/family	0.00913**	0.0052	0.0104*
	(0.0042)	(0.0064)	(0.0058)
Rely on savings	0.112**	0.1	0.115**
	(0.0515)	(0.1180)	(0.0568)
Age of household head	−0.00370***	−0.00476***	−0.00204
	(0.0013)	(0.0017)	(0.0020)
Able to read and write	0.0694***	0.0861***	0.0429**
	(0.0114)	(0.0155)	(0.0170)
Labour hours	0.0011	0.00364*	−0.00406
	(0.0015)	(0.0019)	(0.0025)
Household size	−0.152***	−0.163***	−0.135***
	(0.0087)	(0.0114)	(0.0135)
1.rsector	−0.360***	−0.328***	−0.423***
	(0.0454)	(0.0584)	(0.0730)
1.north_central	−0.162***	−0.156**	−0.176**
	(0.0536)	(0.0734)	(0.0783)
Constant	7.934***	8.002***	7.868***
	(0.0876)	(0.1140)	(0.1390)
Observations	2,345	1,428	917
R-squared	0.261	0.256	0.287

Source: Author's computation.