Nigeria

The welfare impact in Nigeria of the ECOWAS Common External Tariff: A distributional effects analysis

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Abstract

Trade policies often have a different impact on economic agents due to the transmission mechanism through which they operate. In this context, this study uses micro- and macro-economic data to investigate the distributional effects in Nigeria of the Common External Tariff of the Economic Community of West African States. These effects are examined from the perspective of households as producers, consumers, and factor owners. The analysis proceeds in three steps investigating: (a) the tariff pass-through to domestic prices, (b) the linkages between prices and wages, and (c) the impact of both prices and wages on household welfare. The findings indicate that during the period covered by this study, domestic prices declined due to the high tariff pass-through. This decline was higher in the states located closer to ports and borders, where the costs of trade are lower. The Common External Tariff had net positive effects on the welfare of households, largely due to the gains from the expenditure basket. The expenditure gains through lower prices outweighed losses in households' purchasing power incurred through lower income. Poorer households experienced larger welfare gains than richer ones, and urban households were better off than their rural counterparts. The study concludes that the price transmission mechanism and household characteristics are important determinants in assessing trade policy effects in Nigeria. Concerning the price-wage nexus, it does not find strong evidence of price influence on wages. The study suggests that competitiveness of domestic producers should be enhanced through investment in infrastructure and strengthening of relevant government programmes to create employment and improve household income in agriculture and the manufacturing sector. It also recommends social safety net measures, particularly for vulnerable subsistence agricultural households in rural areas, in order to mitigate the effects of the Common External Tariff on their income.

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1 Introduction

The economic integration of developing countries such as Nigeria into global markets offers the opportunity for rapid growth and poverty reduction (Martinez and Poole, 2004), but it also entails risks. For example, Nigeria is endowed with abundant natural resources, especially crude oil, from which it derives over 90 per cent of its foreign earnings. The country has experienced average growth of around 7 per cent during the past five years. However, this growth has not trickled down to the majority of the population, thus reinforcing Nigeria's status as a rich country populated by poor people (World Bank, 1996). The unemployment rate reached 24 per cent in 2011 (NBS, 2012a) and the share of the population living below the poverty line increased from 54 per cent in 1986 to 68 per cent in 2010.[1]

Explaining Nigeria's situation demands a careful analysis of government policies and their effects. This study will focus in particular on the trade dimension and analyse the impact on household welfare of Nigeria's adoption of the Common External Tariff (CET) of the Economic Community of West African States (ECOWAS).[2]

To integrate its economy into global markets, particularly in the ECOWAS sub-region, Nigeria committed itself in 2005 to adopting the ECOWAS CET. During the transition period of 2006–2007, it therefore reduced its tariff rates on all products from a high of 150 per cent to a maximum of 50 per cent.[3]

The CET represents the most-favoured-nation (MFN) rates ECOWAS applies in relation to non-member countries and is part of the move towards a customs union that aims to enhance sub-regional trade integration through the flow of goods and services, especially inputs and intermediate goods for the industrial sector. The ECOWAS CET has four tariff bands: 0 per cent for social needs and basic necessities, 5 per cent for raw materials, 10 per cent for intermediate goods, and 20 per cent for

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[1] Data from the World Bank World Development Indicators database, available at: *http://data.worldbank.org/data-catalog/world-development-indicators.*

[2] The 15 West African states that constitute ECOWAS are: Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo.

[3] This was the maximum tariff rate on both goods and services during the country's transition period leading to the adoption of the CET.

[4] The four bands mentioned above are the current ECOWAS CET bands and are not the same as the bands Nigeria used during the transition period.

finished goods that are not produced locally. Nigeria was granted the possibility of adding a fifth band of 35 per cent for finished goods manufactured locally.[4] Following the adoption of the CET, Nigeria's simple average tariff on agricultural imports dropped from about 32 per cent in 2000 to 15 per cent in 2010, while its tariff on manufactured products fell from 25 per cent in 2000 to 11 per cent in 2010.[5]

Nigeria accounts for more than half of the sub-region's imports. In nominal terms, its total imports increased from USD 6 billion in 1990 to USD 64 billion in 2011, while ECOWAS's total imports rose from USD 14 billion in 1990 to USD 111 billion in 2011 (UNCTAD, 2012). In terms of import composition, Nigeria accounted for 40 per cent of ECOWAS's agricultural imports in 2009 and 79 per cent in 2011, while its industrial imports represented 79 per cent and 65 per cent of those of ECOWAS in 2009 and 2011, respectively. These data confirm the huge trade impact of Nigeria on the sub-region and explain its late and reluctant acceptance of the ECOWAS CET.

In addition, Nigeria's imports from ECOWAS declined over the years in terms of their share in the country's total imports. In 1994, the share of imports from ECOWAS in Nigeria's total imports was about 5 per cent. It then declined to 3.2 per cent in 2005, and fell further to 2.3 per cent in 2012 (IMF, 2013).[6] This reduction in the flow of imports from ECOWAS to Nigeria was a result of inadequate infrastructure and implementation of the sub-regional trade liberalization scheme.[7]

The adoption of the CET has had different effects on Nigerian households, depending on whether they are net consumers or producers of commodities, and on household labour returns. The literature on the transmission mechanism and welfare impact of this type of trade policy does not provide unequivocal conclusions. The different transmission channels through which trade policies operate are usually responsible for the variation of

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[5] Data from the World Bank World Integrated Trade Solution (WITS) database, available at: *http://wits.worldbank.org/wits.*

[6] This suggests that more than 97 per cent of Nigeria's imports of goods and services in 2012 came from countries outside ECOWAS. UNCTAD (2012) shows that less than 7 per cent of Nigeria's imports are sourced from Africa.

[7] The sub-regional trade liberalization scheme, which covers unprocessed goods, traditional handicrafts, and processed and semi-processed goods originating from member countries, aims to ensure the free flow of goods and services across members without subjecting them to tariffs and non-tariff barriers. However, in reality this is not the case, due to bureaucratic processes, lengthy import procedures, corruption in customs and road transport, etc. For more details, see Section 2.

the effects.[8] Most often, trade policies affect domestic prices and returns to production factors (labour), which in turn have effects on the consumption and production decisions of households (Nicita, 2004, 2009; Goldberg and Pavcnik, 2003, 2007; Marchand, 2012; Topalova, 2005, 2010; Porto, 2006; McCaig, 2011; Castilho *et al.*, 2012). This study therefore asks the following questions: To what extent has the ECOWAS CET affected domestic prices? And what has been its effect on household welfare?

In order to address these questions, this study conducts an empirical investigation of the distributional effects of the ECOWAS CET in Nigeria. These effects consist mainly of the impact on the markets where the households operate, on the goods they produce, and on the labour markets where they are active. It is therefore important for the Nigerian government to be aware of the level of CET pass-through to domestic prices, and to ascertain the effects of the price changes on factor income and household welfare. Providing this critical information is the primary objective of this study.

Despite the wide range of analysis in the literature on the distributional impact of trade liberalization, very few studies evaluate the trade liberalization policy of the ECOWAS CET in Nigeria. Balogun and Dauda (2012), Urama *et al.* (2012), Oduh (2012), Ajayi and Osafo-Kwaako (2007), Oyejide (2012), and Nwafor (2006) look only at the macroeconomic impact of the CET on Nigeria. The potential distributional impact has been examined exclusively through *ex-ante* studies: Nwafor *et al.* (2005) use a Computable General Equilibrium (CGE) model to examine the potential impact of the adoption of the CET on rural and urban poverty, and Marchat and Rajhi (2004), Soludo and Oji (2003), and Kuji Ltd. (2002) conduct *ex-ante* analyses at the sectoral and household levels. There are few, if any, *ex-post* studies that examine the distributional effects of the ECOWAS CET on Nigerian households or the level of tariff pass-through onto the country's domestic prices. This study aims to fill this gap by analysing the impact of the ECOWAS CET on Nigeria's households through an *ex-post* econometric analysis using household survey data.

The empirical strategy of this study was adopted from Nicita (2009), Porto (2006), and Marchand (2012). The price effects on household welfare

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[8] While this study focuses on the price and factor return effects of the ECOWAS CET, it is acknowledged that there are other effects that should also be considered, such as those related to employment, agricultural outputs, and investment.

[9] Due to inconsistencies in the implementation of the scheme by members, there are still non-tariff barriers such as certificates of origin, standards requirements, bureaucratic problems, unofficial fees, delays at borders, waste and theft at ports, harassment by the police and other security agents at a number of locations, and inter-country payment difficulties (ECOWAS Vanguard, 2013).

depend on the budget share of each commodity, the share of household income from the commodity, and the price change of the commodity due to trade. The methodology first determines the impact of the ECOWAS CET on domestic prices; it then examines the linkage between domestic prices and wages. The final analysis combines the effects of price and wage changes on household welfare. The results show that the ECOWAS CET has net positive effects on household welfare, mainly due to the gains from the expenditure basket. During the period covered by the study, consumers benefited from the CET through the expenditure gains that outweighed the losses due to lower income. Poorer households experienced larger welfare gains than richer ones, and urban households were better off than their rural counterparts. This is because urban households depend less on product sales, especially those of agricultural products.

The study therefore provides evidence that the price transmission mechanism, household characteristics, and the sector of labour activity are important determinants in the assessment of trade policy effects in Nigeria.

The study is organized as follows. Section 2 explains the context of the analysis undertaken by the study. Section 3 describes the data used. Section 4 details the methodology and research findings. The conclusions are presented in Section 5.

2 Policy context

The volume of intra-regional trade flows depends to a large extent on the trade and other economic policies implemented by ECOWAS member countries. The ECOWAS Trade Liberalization Scheme (ETLS) has aimed to promote cooperation and integration among member states through trade liberalization and progress towards the creation of a common market. When the scheme started in 1979, it included only handicraft, agricultural and unprocessed products, but in 1990 it was expanded to accommodate industrial products, with the application of rules of origin in line with WTO agreements. The ETLS has not yet been fully implemented by member states,[9] which has affected intra-ECOWAS trade flows – as a percentage of the sub-region's total imports those flows declined from 13.2 per cent in 2000 to 10.7 per cent in 2011. Total intra-regional trade has been increasing, but at a decelerating rate (UNCTAD, 2012),[10] despite the zero

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[10] For instance, the intra-ECOWAS trade in 2005 was 131 per cent above the 2000 trade value, but it only grew by 34 per cent between 2005 and 2011. Thus, there has been marginal trade creation in the sub-region.

preferential tariffs agreed upon in principle within the sub-region. Each member country has its own tariff schedules applicable to imports without preferential arrangement.

Nigeria's trade policy has been rather protective. Only recently, the country has made efforts, along with other sub-regional partners, to liberalize trade in order to reap benefits related to trade liberalization. One such effort was Nigeria's acceptance of the ECOWAS CET. Prior to consenting to the CET, Nigeria had a maximum tariff peak of 150 per cent, which was reduced to 50 per cent during the transition period. This indicates that the country liberalized its trade by about 67 per cent following the ECOWAS CET. Imports responded accordingly, with a 967 per cent increase in 2011 compared to the 1990 level.

Table 1 Nigeria's imports and tariffs, 2000–2010

Sector	Year	Total imports (millions of USD)	Weighted average tariffs (per cent)
Agriculture	2000	963	30.2
	2002	1,506	32.9
	2005	2,054	22.4
	2008	3,845	9.8
	2010	3,436	8.8
Manufacturing	2000	4,852	17.8
	2002	7,252	15.4
	2005	15,669	9.8
	2008	34,092	9.9
	2010	30,202	10.7

Source: World Bank WITS.
Note: The value of imports is expressed in nominal terms.

Table 1 shows that agriculture was the most liberalized sector, with a weighted average tariff declining from 30.2 per cent in 2000 to 8.8 per cent in 2010. Correspondingly, imports of agricultural commodities rose from USD 963 million in 2000 to USD 3.4 billion in 2010, an increase of more than 250 per cent over ten years. However, the share of agricultural imports in the gross domestic product (GDP), which was 2 per cent in 2000, declined to about 1.5 per cent in 2010. Manufacturing sector imports grew from slightly less than USD 5 billion in 2000 to more than USD 30 billion in 2010, which was 13 per cent of GDP for that year compared to about 11 per cent in 2000. The weighted average tariff fell from 17.8 per cent in 2000 to 10.7 per cent in 2010, which, among other factors, could be responsible for the 522 per cent rise in the import of manufactured products into

Nigeria during the period. Aggregate imports rose from about USD 9 billion in 2000, which represented 18.8 per cent of the GDP, to USD 44 billion in 2010, a share of 19.3 per cent of GDP. However, both agricultural and manufactured imports declined between 2008 and 2010. This was due in part to internal unrest in the oil-rich Niger delta zone, which led to a considerable drop in crude oil earnings. This affected exploration activities of oil companies and the country's foreign exchange earnings, which in turn impacted the economy, especially the propensity to import.

Nigeria's global integration was boosted by trade liberalization, which was accompanied by substantial adjustments in the prices of both agricultural and manufactured goods between 2005 and 2011. There was a mild consistency in price movement across states and years in both agricultural and manufactured products (see Table A1 in the Annex). Some oscillations are observed in the variance of the log of prices across states and years, suggesting that there were considerable price differentials across and within the states over these years, probably due to the states' preferences and endowment differentials, varying input costs, transportation costs, and market regulations.

3 Data description

This study uses several data sources. Tariff data were taken from the World Bank World Integrated Trade Solution database, while world prices were sourced from the World Bank Commodities Price Data[11] at nominal USD that were converted into domestic currency at the prevailing exchange rates. Nominal domestic consumer prices[12] from 2006 to 2011 come from the National Bureau of Statistics (NBS).[13] NBS (2012b) provides statistics for the shares of the following food items in total household consumption in Nigeria: rice (6 per cent), maize (3 per cent), other cereals including sorghum (7 per cent), poultry including chicken (0.4 per cent), fruit including oranges (1.2 per cent), beans and peas including

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[11] The Commodities Price Data (also known as "Pink Sheet") are a monthly collection of commodity prices and indices published by the World Bank. Available at: *http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTDECPROSPECTS/0,,contentMD-K:21574907~menuPK:7859231~pagePK:64165401~piPK:64165026~theSitePK:476883,00.html.*

[12] These prices cover agricultural items such as rice, maize, sorghum, soya beans, chicken, groundnut, and oranges, as well as five manufactured processed goods: groundnut oil, tea, wheat flour and bourn-vita. The selection of products in both agricultural and manufacturing sectors is based on their importance to the average Nigerian household. The study uses the actual (nominal) prices of these commodities and not price indices.

[13] These data are not available in any NBS publication or online. They were requested specifically for this study.

groundnut (6 per cent), oil, fat and oil-rich nuts including groundnut oil (2 per cent), chocolate, confectionary, bourn-vita, (1 per cent), and wheat flour-related food items including bread (2 per cent). All Nigerian states, including the Federal Capital Territory, were considered. Efforts were also made to categorize the states along their geopolitical zones in order to reflect policy directions and stimulate national strategic planning and programmes. There are six geopolitical zones in Nigeria: South-West, South-East, South-South, North-West, North-East, and North-Central (see Figure A1 in the Annex).

The trade cost in this study, measured by the distance of each state to the nearest seaport, is calculated using the GlobeFeed distance calculator.[14] Nigeria has 21 seaports that can be used to import goods (Jaja, 2011). The major seaports are Tin Can Island, Apapa, Kirikiri (Lagos), Warri (Delta), Port Harcourt (Rivers State), and Calabar (Cross River).[15] Most seaport activities take place in the Lagos and Rivers States. Thus, this study uses the distance from each state's capital to the closer one of the two major seaports where most seaport activities take place.

For the price-wage nexus estimation, information on households was obtained from two surveys conducted by the NBS: the 2010 General Household Survey-Panel (Post-Planting), and the 2011 General Household Survey-Panel (Post-Harvest).[16] The surveys provided information on expenditure, income, household characteristics, wages, sector of activity, education, and gender. The wages were individual average monthly wages from the household surveys. Activities were grouped in six sectors: agriculture, manufacturing, commerce, services, transport and construction.

4 Methodology and findings

This study builds on the methodological approaches of Porto (2006), Nicita (2009), and Marchand (2012) to measure the effects of the ECOWAS CET on household welfare through prices and wages. It investigates the impact of the ECOWAS CET on domestic prices, the linkage between domestic prices and wages, and the combined effect of price and wage changes on household welfare.

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[14] Available at: *distancecalculator.globefeed.com.*

[15] All these seaports are located in the southern part of the country.

[16] The World Bank's Migration and Remittances Household Survey was dropped due to the non-availability of variables of interest, especially household wage income and sales.

4.1 Tariff-price nexus

This sub-section makes some specific assumptions for the model. It is assumed that consumer goods are not differentiated by origin, and that their prices are at average levels of imported and domestic producer prices. Also, it is assumed that trade costs only affect imported goods. Thus, the retail price that households face by consuming a good g at time t in state s, P_{gts} will depend on the domestic producer prices of the good (PP^a_{gts}), the international prices in domestic currency (P^*_{gt}), tariffs (τ_{gt}), and trade costs (TC_{gts}). This is written as:

$$P_{gts} = PP^a_{gts} [P^*_{gt} (1 + \tau_{gt}) TC_{gts}]^{1-\alpha} \tag{1}$$

where α measures the extent to which the local varieties dominate the imported ones, and $1-\alpha$ is the pass-through which indicates the extent to which international prices, tariffs, and trade costs affect domestic prices. If $\alpha=0$, then there is a complete pass-through and the full extent of the border price changes is reflected in the consumer prices, which is likely to occur when no local production exists. If $\alpha=1$, then the pass-through is nil, indicating that there is no effect of border price changes on the price of goods paid by consumers, which corresponds to a situation of relative autarky where domestic markets are dominated by local producers. Equation (2) presents the linearized form of equation (1):

$$\ln P_{gts} = \alpha \ln PP_{gts} + (1 - \alpha) \ln P^*_{gt} + (1 - \alpha) \ln(1 + \tau_{gt}) + (1 - \alpha) \ln TC_{gts} \tag{2}$$

Following Nicita (2009) and Campa and Goldberg (2002), the unrestricted form of equation (2) is assumed, which gives the following equation:

$$\ln P_{gts} = \beta_0 + \beta_1 \ln PP_{gts} + \beta_2 \ln P^*_{gt} + \beta_3 \ln TC_{gts} + \gamma \ln (1 + \tau_{gt}) + \varepsilon_{gts} \tag{3}$$

In equation (3), the shortest distance to the nearest main port of entry is used as a proxy for trade costs. Thus, in line with this study's objective of distilling the effect of trade policy on domestic prices at the state level, we include an interaction term between distance and the tariff rate in the final equation. This is to isolate the domestic impact of tariff changes on the pass-through. Thus, in line with Nicita (2009) and Marchand (2012), the following econometric equation is adopted to estimate the tariff pass-through effect in the case of Nigeria:

$$\ln P_{gts} = \beta_0 + \beta_1 \ln PP_{gts} + \beta_2 \ln P^*_{gt} + \beta_3 \ln TC_{gts} + \beta_4 \ln (1 + \tau_{gt})$$
$$+ \beta_5 \ln (1 + \tau_{gt}) TC_{gts} + \beta_6 [\ln (1 + \tau_{gt}) TC_{gts}]^2 + \pi_t + \varepsilon_{gts} \tag{4}$$

where P_{gts} represents the domestic price of good g in state s at time t, PP_{gts} is the producer price of the good, P^*_{gt} is the world price, TC_{gts} is the trade cost, τ_{gt} is the tariff, π_t are time-fixed effects, and ε_{gts} is the error term. By controlling for time, the study assumes that the error term does not include factors that affect simultaneously tariffs and prices.

Reduced-form models often assume a perfect pass-through, i.e. changes in tariffs perfectly transmitted to domestic prices, and thus to households. However, there are many market imperfections and transaction costs that may affect the transmission chain and explain the absence of clear empirical results in line with the theoretical predictions. This is especially the case in developing countries such as Nigeria, where geographical locations and domestic markets are highly segmented.

The nominal consumer prices for seven agricultural products and four manufacturing goods were sourced from the NBS. The same source also provided the producer prices. The world prices, converted into local prices at the prevailing exchange rates, were sourced from the World Bank Commodities Price Data. The nominal domestic consumer prices for each product were collected across the 36 states and the Federal Capital Territory. Distance from each state's capital to the nearest seaport was taken from the GlobeFeed distance calculator. The World Bank World Integrated Trade Solution database provided the tariffs at the Harmonized System 2-digit level for the period from 2006 to 2011.

Table 2 shows the estimates of tariff pass-through for prices of both agricultural and manufactured goods.[17] The table presents the estimated results for four different specifications of equation (4): estimation without tariff-distance interaction in specification 1; estimation without tariff-distance interaction but with time-fixed effects in specification 2; estimation with tariff-distance interaction in specification 3; and estimation with tariff-distance interaction and time-fixed effects in specification 4. Table 2 is based on national data in which the estimations were performed using feasible generalized least square (FGLS) cross-sectional time series, which corrected for any heteroskedasticity in standard errors.[18] The table shows evidence of significant pass-through in the estimates of prices of all agricultural goods. The pass-through tends to increase substantially with the inclusion of time-fixed effects. This indicates that the pass-through in the agricultural sector is time-specific. The tariff-distance interaction, which

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[17] The producer prices are the domestic substitute prices; the estimated coefficients are significant in all the cases.

[18] The Hausman-Taylor estimation reveals that the instrument variables are not required.

is another variable of interest, is statistically significant, with the expected sign in the agricultural estimates. The results with regard to manufactured goods show pass-through much higher than 100 per cent, which is not plausible. These extreme results may be due to the quality of the data and are therefore not taken into account in this study.

For agricultural goods, the tariff pass-through coefficient is estimated to be between 73 and 99 per cent. The results show that any exclusion of time-fixed effects reduces the estimated pass-through for agricultural goods. This indicates that the pass-through depends on time, thus confirming the findings of Marchand (2012).

The magnitude of the pass-through also shows that the consumers of agricultural goods benefited from the tariff reduction through the ECOWAS CET. When the distance is interacted with the tariffs, the pass-through is found to significantly decline with distance from the seaports. Table 2 shows that all the coefficients of interest (tariffs and tariff-distance) have the expected signs and are significant in agricultural goods estimates. All standard errors are mitigated against heteroskedasticity in the FGLS estimation.

Table 2 Tariff pass-through to domestic prices

	Dependent variable – Log of prices			
	Specification 1	Specification 2	Specification 3	Specification 4
Agriculture				
Constant	–1.4507***	–1.0552***	–1.4960***	–1.0983***
	(0.1682)	(0.1702)	(0.1674)	(0.1694)
Tariffs	0.7377***	0.9910***	0.3694**	0.6570***
	(0.1120)	(0.1152)	(0.1534)	(0.1533)
World price	0.3133***	0.2652***	0.3168***	0.2687***
	(0.0141)	(0.0149)	(0.0140)	(0.0148)
Domestic substitute price	0.7565***	0.7319***	0.7751***	0.7503***
	(0.0107)	(0.0109)	(0.0113)	(0.0114)
Tariff*Distance			–0.0011***	–0.0011***
			(0.0004)	(0.0004)
Tariff*Distance squared			5.08e-06***	5.24e-06***
			(1.12e-06)	(1.12e-06)
Wald Chi-square	5925.85	6194.61	6086.7	6351.66
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Observation	1273	1273	1273	1273
Manufacturing				
Constant	6.9652***	7.0759***	6.9123***	7.0257***
	(0.3145)	(0.3067)	(0.3092)	(0.3029)

	Dependent variable – Log of prices			
	Specification 1	**Specification 2**	**Specification 3**	**Specification 4**
Tariffs	2.8358***	2.4836***	3.0516***	2.7305***
	(0.2762)	(0.2746)	(0.3023)	(0.3007)
World price	–0.3428***	–0.3709***	–0.3197***	–0.3500***
	(0.0385)	(0.0378)	(0.0382)	(0.0377)
Domestic substitute price	0.4909***	0.4952***	0.4654***	0.4737***
	(0.0320)	(0.0312)	(0.0320)	(0.0313)
Tariff*Distance			–0.0033***	–0.0028
			(0.0008)	(0.0007)
Tariff*Distance Squared			1.01e-05***	8.04e-06***
			(2.56e-06)	(2.55e-06)
Wald Chi-square	262.57	307.64	280.61	320.65
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Observation	733	733	733	733
Time effects	No	Yes	No	Yes

Source: Author's estimations.

Note: All variables are in log. The standard errors, corrected for heteroskedasticity, are presented in parentheses, except for the Wald Chi-square, for which the parenthesis reports the probability value. The significant variables are denoted by *, ** and *** at 10, 5, and 1 per cent significance levels, respectively. The tariff-distance interaction isolates empirically the local effects of tariff transmission (see Nicita, 2009).

4.2 Pass-through estimates

Using specification 1[19] in Table 2, the pass-through in the country is estimated at 74 per cent for agricultural goods, which is in a relatively high range compared to the 33 per cent for agriculture and 27 per cent for manufacturing in Nicita (2009). Campa and Goldberg (2002) found a 40 per cent pass-through for manufacturing in the United States and 70 per cent in Germany. Frankel *et al.* (2005) obtained a 50 per cent pass-through to imported prices in a group of developing countries, while Marchand (2012) reported between 33 and 49 per cent for rural areas and 64 and 68 per cent for urban areas in India. In our analysis, the world price pass-through for agricultural goods has significant positive effects in all the specifications. The elasticities of world prices range between 27 and 31 per cent.

The results also present the elasticities of the interaction of tariffs and distance, which show the extent to which trade costs, through distance, affected tariff pass-through. The estimates of tariff-distance interaction show that there are virtually no regional differences across states in the effects of the ECOWAS CET on prices of manufactured goods; however, there are relative

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[19] This estimation was done without the interaction of distance with tariffs and time-fixed effects.

regional differences with regard to prices of agricultural goods. This result is different from Nicita (2009), who found regional differences in manufactured goods but no differences across states in agricultural goods. The tariff pass-through for agricultural goods prices is statistically significant, indicating that the tariff reduction is significantly transmitted to consumers across states through lower prices of agricultural goods. In other words, the consumers of agricultural goods benefited from the ECOWAS CET.

States closer to ports are found to be more exposed to the impact of changes in agricultural tariffs. Considering the state/regional differences, the tariff pass-through at the border is 66 per cent for the agricultural sector and it declines to 11 per cent at 100 kilometres from the port or border of entry.[20] The decline in the tariff pass-through as one gets farther away from ports of entry or borders is due to the associated trade costs, inadequate trade facilitation, and, most importantly, the poor state of infrastructure, which reduce household consumption gains from the tariff reduction and income loss for producers. The results for manufactured goods go in the same direction.[21] However, possibly due to the quality of the available data, the estimates are out of a plausible band, which does not allow for a consistent interpretation.

The transmission of tariffs to domestic prices varies marginally across states. Table A2 in the Annex presents state-specific tariff elasticities that were obtained from specification 4 of Table 2.[22] Results show that households that are close to ports of entry benefit significantly from the tariff reduction. The relatively higher pass-through in agriculture in the Lagos and Rivers States is due to the location of functional ports of entry there. In fact, Lagos ports account for more than 70 per cent of port activities in Nigeria (Jaja, 2011). In addition, smuggling activities at the ports and borders in these states, which are the result of Nigeria's porous borders (Adeola and Fayomi, 2012; Ohai, 2013),[23] may have an effect on these elasticities.[24] Smuggled goods, especially agricultural goods, avoid tariffs and are cheaper than tariffed goods.

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[20] The tariff pass-through at the border is the coefficient of tariffs in specification 4 in Table 2, while the estimate of the tariff-distance interaction gives the change in tariff pass-through for every kilometre of distance from the port or border.

[21] Nicita (2009) opined that the tariff-distance square coefficient could take any sign depending on the rate of decline of the pass-through with distance.

[22] The state-specific pass-through elasticities were obtained by finding the derivatives of equation (4) with respect to the tariff and then inserting the value of the coefficients from specification 4 in Table 2 before estimating it for each state.

[23] This is the reason for the recent directive by the federal government (the Nigerian Customs Service) that all rice importation must now go through the seaports.

[24] There are 1,497 illegal and 84 legal routes (borders) to Nigeria (Owete, 2013).

4.3 Price-wage nexus

In linking domestic prices to wages,[25] wage-price elasticities are estimated following the framework proposed by Nicita (2009). The estimating equation considers product prices and worker characteristics:

$$\ln W_{ijst} = \sum_{gsr} \theta^r \ln P_{gst} \, x^{g,r} + l_i \emptyset + H_j \varphi + \varepsilon_{ijst} \tag{5}$$

where W_{ijst} is the observed wage of individual i in household j, state s at time t, P_{gst} is the price of good g[26] in state s at time t, l_i is a vector of individual characteristics, H_j represents a vector of household attributes, θ^r indicates a dummy variable for worker skills[27] and $x^{g,r}$ measures responses of wages of skilled and unskilled workers to prices.

The wages are individual monthly wages as observed in the household surveys. The control variables are age, level of education, gender, region (rural and urban), and occupation sector.[28] The consumer prices from the tariff pass-through are used in the wage equation. The wages of individuals between the age of 15 to 65 were used. In the estimation, the reference categories are the construction sector for occupation, female for gender, rural for region, and first degree holder for education. The state- and year-fixed effects are included in the regression to control for state and year specific effects. The construction of the aggregate price was based on the average prices of the basket of agricultural and manufacturing products, in line with Nicita (2009).

The results of the relationship between prices of agricultural and manufactured goods and wages are presented in Table 3. The table shows the estimates of wage-price elasticities under two different specifications of equation (5): without state- and time-fixed effects in specification 1, and with state- and time-fixed effects as in Nicita (2009) in specification 2. These estimations are carried out using the FGLS in order to fit the panel

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[25] The wages were obtained from the surveys and included all members of households that engaged in either farm or non-farm economic activities for wage income. NBS (2012a) reports that about 80 per cent of urban families earn income from non-farm business activities, while about 60 per cent of agricultural households also have non-farm enterprise earnings.

[26] A composite agricultural good and a composite manufactured good are used in this analysis.

[27] Wage earners with nine or more years of education are regarded as skilled.

[28] Ten different education levels were considered: no education, primary, junior secondary, senior secondary, technical, grade II, ordinary national diploma, higher national diploma, first degree, and postgraduate degree. The occupation sectors include agriculture, manufacturing, commerce, services, transport, and construction.

data linear model.[29] Age, highest education attained, gender, region and sector of occupation of the workers are used as the control variables. The state-fixed effects in this framework account for the productivity differential across the states due to each state's policy specificities.

Table 3 Wage-price elasticities

	Dependent variable - Log of wage	
	Specification 1	**Specification 2**
Constant	6.4145***	6.6170***
	(0.3075)	(0.3471)
Manufacturing price skilled	0.0150	0.0017
	(0.0329)	(0.0323)
Manufacturing price unskilled	0.0095	0.0119
	(0.0366)	(0.0360)
Agriculture price skilled	–0.0171	–0.0140
	(0.0115)	(0.0149)
Agriculture price unskilled	0.0065	0.0139
	(0.0168)	(0.0165)
Age	0.0633*	0.0280
	(0.0358)	(0.0365)
Agriculture	–0.2002**	–0.1140
	(0.0820)	(0.0819)
Manufacturing	0.0002	0.0828
	(0.0982)	(0.0984)
Commerce	–0.0553	0.0037
	(0.0883)	(0.0847)
Services	0.0571	0.1038
	(0.0831)	(0.0829)
Transport	0.1505	0.1955*
	(0.1068)	(0.1061)
Sex	0.1326***	0.1098***
	(0.0280)	(0.0281)
Region	0.1162***	0.0670**
	(0.0299)	(0.0322)
No education	–0.9740***	–1.0326***
	(0.3511)	(0.3457)
Primary	–0.7931**	–0.8772***
	(0.3511)	(0.3448)

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[29] It allows estimations in the presence of the AR(1) autocorrelation within panels and cross-sectional correlation and heteroskedasticity across panels.

	Dependent variable - Log of wage	
	Specification 1	**Specification 2**
Junior secondary	–0.6736***	–0.7150***
	(0.1714)	(0.1692)
Senior secondary	–0.3189	–0.3041
	(0.2194)	(0.2163)
Technical	–0.5633***	–0.6047***
	(0.1666)	(0.1643)
Grade II	–0.3974**	–0.4262***
	(0.1698)	(0.1674)
Ordinary national diploma	0.1613	–0.1121
	(0.2409)	(0.2422)
Higher national diploma	–0.1482	–0.1630
	(0.1720)	(0.1692)
Postgraduate	–0.3677	–0.2975
	(0.4029)	(0.3958)
Wald Chi-square	481.74	546.87
	(0.0000)	(0.0000)
Observation	8780	8780
State-fixed effects	No	Yes
Time-fixed effects	No	Yes

Source: Author's estimations.

Note: All variables except the dummies are in log. The standard errors are presented in parentheses except for the Wald Chi-square, for which the parenthesis reports the probability value. The error term is free from autocorrelation. Skill takes the value of 1 when the worker has at least a secondary education, otherwise it is zero. Sex is 0 for female and 1 for male. The estimation uses female, construction occupation, rural and first degree holders as references.

The estimates from Table 3 show that the coefficients of many of the control variables are significant, with the majority having the expected signs. Wages tend to increase with education and age. For education, all coefficients have the expected signs, except for ordinary national diploma and postgraduate degree, but are non-significant. Wages also tend to be higher for male workers and for workers in urban areas. There is a difference in the coefficient controlling for occupation, as lower wages are found in agriculture, while the highest wages are in transport occupations.

In general, the results show a positive correlation between manufacturing and agricultural prices and wages, except for the interaction of agricultural prices and skilled labour that is negative. The results also indicate that skilled wages are more responsive to manufacturing prices when state- and time-fixed effects are not included in the estimation. However, with state- and time-fixed effects, unskilled wages are more responsive. Skilled wages are also more responsive to agricultural prices. There are few differentials in wages between states over time in the manufacturing sector

and virtually none in agriculture. This implies that there are virtually no state-specific peculiarities that influence wages. Thus, the result shows that there is no significant relationship between prices and wages,[30] indicating that the nexus between prices and wages is not established in this study.

4.4 Welfare impact

The empirical analysis in this sub-section examines the impact of the ECOWAS CET on Nigerian households by focusing on the price changes of traded goods and wage income. The specific results regarding the welfare effects of trade liberalization in geopolitical zones and states are presented in Table A2 in the Annex.

In Nigeria, many households are simultaneously wage earners, producers and consumers of goods. It is therefore important to recognize these roles when analysing the impact of any policy on household welfare.[31] The share of wages in the income of most households is small compared to the income from sales of agricultural and manufactured goods. In rural areas, agricultural sales often constitute the bulk of the household income. This income is then increased through wages earned from labour rendered by the members of the household in other farm or non-farm activities.[32] However, in urban areas, income from manufacturing sales and wages represents the most important component of household income. Expenditure on agricultural products, especially food items, often forms the bulk of household expenses.

Following Porto (2006), Nicita (2009), and Marchand (2012), this study estimates the effects of trade policy on household welfare. It indicates that changes in utility dU_{hs} of household h in state s depend on the changes in local prices (both goods and factors), household-specific labour income, agricultural production, and consumption. This relation is presented in equation (6).

$$dU_{hs} = \sum_r \theta_h^r \, dW_s^r + \sum_g \theta_{hg}^x \, dP_{gs} - \sum_g \theta_{hg}^c \, dP_{gs} \qquad (6)$$

where θ_{hg}^c is the income share spent on good g by household h, θ_{hg}^x is the income share obtained from selling goods produced at price P, θ_h^r is the

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[30] This could be due to rigidity on the part of employers in adjusting wages, even in the presence of price changes. Also, the country's minimum wages determined by the federal government tend not to react fast to price changes.

[31] See Singh *et al.* (1986) for the farm household model, a standard model which is often used to measure changes in households' welfare.

[32] The largest proportion of Nigeria's labour is in the agricultural sector (IFAD, 2012).

income share earned from labour, and dP_{gs} and dW_s^r are changes in prices and wages, respectively. Aggregate welfare change is therefore given by the sum of the welfare changes of all households. Thus, households' exposure to changes in prices and wages will depend on their income structure and expenditure allocation. The calculation for each household was done taking into consideration expenditure and income, the different types of labour supplied (skilled and unskilled), and the fact that the price effects estimations vary among states. Aggregating the results across households, the study finds that the effects of the ECOWAS CET on households in Nigeria vary both across income groups and states. This is due to the differences in economic behaviours, endowments and pass-through across the states. Due to the insignificance of the wage elasticities, this analysis only considers the effects of price changes on welfare.

Earlier results indicated that tariff liberalization led to price reductions in both agricultural and manufactured goods. Unskilled and skilled wages in both sectors remained basically unchanged after trade liberalization. Some selected details about the impact of the ECOWAS CET are presented in Table A2 in the Annex. It can be seen that the CET has resulted in an increase of overall household welfare of 6.9 per cent at the national level. The gains originate from the expenditure basket (8.9 per cent), which compensated for the losses incurred by households from sales of agricultural goods (1.9 per cent). Disaggregating the effects indicates that there are differences across geopolitical zones and states as well as between rural and urban areas.

In terms of the geographical distribution of welfare gains due to the CET, the analysis finds that households in the northern states have benefited more than those in the southern states, due to higher expenditure gains. Furthermore, the overall change in real income due to the CET in the agricultural sector indicates that the producers in this sector have been adversely affected due to the generally high level of pass-through. Although the CET has negatively affected the producers of agricultural products, consumers of agricultural products have been better off due to the availability of wider variety of cheaper goods.

This study also finds that the effects of the CET vary along the income distribution. The mean expenditure gains across income percentiles are shown in Figure 1.[33] On average, all household income groups have experienced expenditure gains, but to varying degrees.

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[33] The figure shows changes in real income due to changes in expenditure, agricultural and manufacturing sales.

Figure 1 Changes in real income
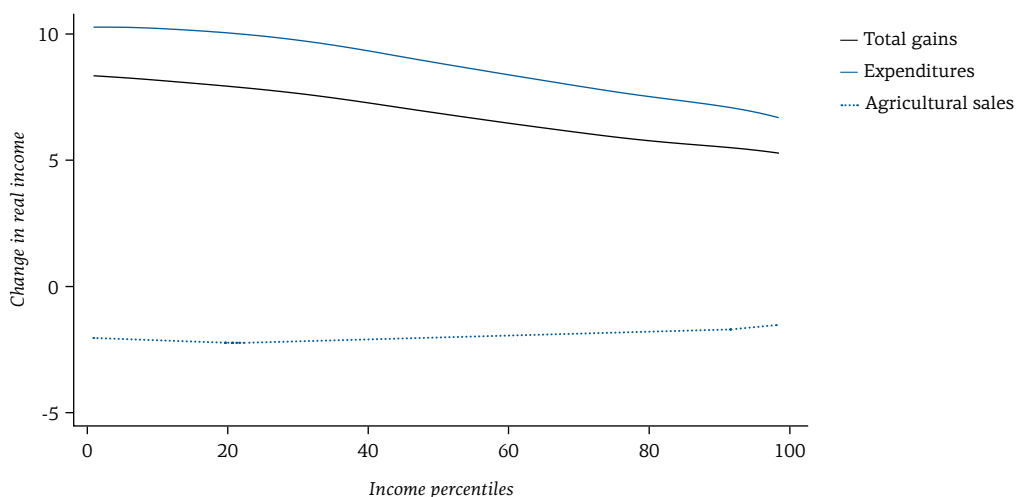
Source: Author's estimations.

Figure 2 shows average total gains. All income groups have benefited from trade liberalization, and households at lower income levels have experienced higher welfare gains. It can be seen from the figure that all households have benefited from lower expenditure due to lower prices, with those in the 80th and 100th percentiles gaining less and those in the lowest income percentile gaining the most. Thus, the poorest households in Nigeria on average have benefitted more from the CET than the richest households, due to a greater share of agricultural goods in their expenditure basket. High-income households have experienced lower welfare gains due to the small share of agricultural commodities in their expenditure. The real income of households has changed due to the fact that agricultural sales have been negative for households relying mostly on sales of these products.

Figure 2 Total gains
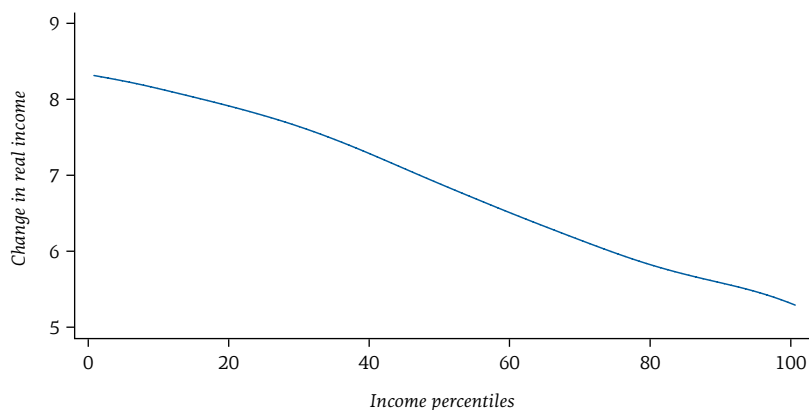
Source: Author's estimations.

5 Conclusions

This study examined the extent to which households have been affected by the Common External Tariff of the Economic Community of West African States. The empirical analysis examined economic consequences of the CET from the perspective of households as producers, consumers and workers, as well as the transmission of the tariff reduction under the CET to domestic prices. The results show that the ECOWAS CET has reduced domestic prices of agricultural goods. The study did not find a significant link between wages and prices. The findings also indicate that so far the CET has had a net positive effect on households in Nigeria, largely due to the gains from expenditure which outweighed the losses in the households' purchasing power due to lower income from the sales of agricultural products. Consequently, household welfare has improved as a result of the CET, particularly for poor households in rural areas; the gains for higher-income households have been more modest. Some groups of households whose income depend largely on activities in the agricultural sector, specifically product sales, have seen a depletion of their purchasing power.

Despite the overall net positive effects of the CET, the study finds differences in the distribution of welfare gains across states, geopolitical zones and income groups. Richer households have experienced lower welfare gains than poorer households. The welfare gains of urban households and male-headed households have been higher than those of rural households and female-headed households, respectively. Rural households in states

[34] This would include labour market reforms.

with ports of entry and near borders have seen their purchasing power eroded more than households in urban areas. Consumers in states with ports of entry have been more exposed to goods available at relatively lower prices due to the CET than those in other states. Thus, the study provides evidence that domestic price transmission, household characteristics, and sectors of economic activity are significant in assessing the welfare effects of trade policies in Nigeria.

This study provides relevant findings about welfare implications of the ECOWAS CET which could serve in the formulation of Nigeria's national economic transformation agenda in the areas of trade and investment, agricultural productivity, and wealth and job creation.[34] The capacity of producers should be enhanced through an informed, integrated and inclusive policy for both the manufacturing and agricultural sectors that would stimulate productivity and value addition. The government should boost investment in vital sectors of the economy by improving infrastructure, access to finance and quality of education, promoting science and technology, facilitating land acquisition, etc. For instance, the Commercial Agriculture Development Programme, as well as other programmes of the Ministry of Agriculture and Rural Development, should be reinforced. This could enhance the competitiveness of domestic producers and increase the volume of output, employment and income levels.

Policy measures are also needed to mitigate the domestic effects of government trade policies. In this context, the National Poverty Eradication Programme, the National Directorate of Employment's Programme, the Subsidy Reinvestment and Empowerment Programme, and other relevant government programmes should be strengthened to create jobs and wealth in agriculture and the manufacturing sector. Social safety nets and security measures should also be put in place at the rural level, especially for vulnerable populations, in order to mitigate the negative income effects of the CET on rural households.[35]

Finally, efforts could also be made to reduce the number of banned products, as such import bans may have the tendency to encourage smuggling because some of the banned goods are in demand given their limited domestic production. This leads to a situation whereby government bans, while trying to protect domestic producers, result in a proliferation of illegal/informal importation.

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[35] The National Poverty Eradication Programme could liaise with the Ministries of Youth and Women's Affairs to come to the aid of vulnerable populations by empowering them economically.

Annex

Table A1 Domestic prices by year and state, 2006–2011 (log)

	Agriculture				Manufacturing			
	2006	**2007**	**2009**	**2011**	**2006**	**2007**	**2009**	**2011**
Abia	5.386	5.418	5.580	5.738	5.375	5.509	5.731	5.902
	(1.201)	(1.160)	(1.145)	(1.270)	(0.645)	(0.671)	(0.583)	(0.614)
Adamawa	5.205	5.143	5.413	5.559	5.389	5.468	5.678	5.778
	(1.256)	(1.373)	(1.150)	(1.266)	(0.631)	(0.640)	(0.638)	(0.602)
Akwalbom	5.419	5.445	5.615	5.861	5.470	5.555	5.714	5.858
	(1.182)	(1.165)	(1.125)	(1.258)	(0.648)	(0.673)	(0.624)	(0.595)
Anambra	5.274	5.380	5.616	5.712	5.430	5.473	5.647	5.817
	(1.105)	(1.166)	(1.232)	(1.251)	(0.625)	(0.632)	(0.582)	(0.571)
Bauchi	5.118	5.082	5.352	5.900	5.429	5.474	5.570	5.769
	(1.373)	(1.332)	(1.190)	(1.336)	(0.700)	(0.651)	(0.579)	(0.594)
Bayelsa	5.708	5.473	5.612	5.871	5.436	5.599	5.680	5.900
	(1.226)	(1.038)	(1.063)	(1.393)	(0.597)	(0.471)	(0.623)	(0.621)
Benue	5.151	5.178	5.427	5.722	5.422	5.465	5.681	5.837
	(1.276)	(1.423)	(1.229)	(1.393)	(0.652)	(0.631)	(0.592)	(0.601)
Borno	5.187	5.169	5.337	5.516	5.399	5.417	5.591	5.812
	(1.394)	(1.396)	(1.230)	(1.189)	(0.646)	(0.588)	(0.579)	(0.608)
Cross River	5.405	5.362	5.522	5.847	5.456	5.532	5.688	5.870
	(1.173)	(1.129)	(1.124)	(1.184)	(0.654)	(0.655)	(0.610)	(0.604)
Delta	5.289	5.432	5.587	5.812	5.389	5.509	5.864	5.852
	(1.070)	(1.110)	(1.039)	(1.196)	(0.642)	(0.666)	(0.772)	(0.610)
Ebonyi	5.241	5.320	5.594	5.761	5.432	5.486	5.646	5.778
	(1.070)	(1.155)	(1.120)	(1.127)	(0.665)	(0.666)	(0.587)	(0.593)
Edo	5.417	5.461	5.568	5.821	5.398	5.468	5.711	5.821
	(1.078)	(1.112)	(1.150)	(1.223)	(0.598)	(0.610)	(0.628)	(0.589)
Ekiti	5.245	5.312	5.657	5.698	5.237	5.512	5.646	5.821
	(1.170)	(1.296)	(1.357)	(1.253)	(0.760)	(0.652)	(0.561)	(0.576)
Enugu	5.252	5.390	5.612	5.635	5.369	5.398	5.657	5.785
	(1.194)	(1.263)	(1.171)	(1.246)	(0.613)	(0.595)	(0.601)	(0.576)
Gombe	5.016	5.120	5.345	5.546	5.394	5.418	5.575	5.741
	(1.284)	(1.396)	(1.226)	(1.298)	(0.634)	(0.637)	(0.616)	(0.574)
Imo	5.356	5.374	5.534	5.901	5.430	5.418	5.658	5.846
	(1.067)	(1.157)	(1.186)	(1.321)	(0.630)	(0.605)	(0.598)	(0.584)
Jigawa	4.840	4.952	5.298	5.486	5.505	5.371	5.671	5.787
	(0.965)	(1.246)	(1.189)	(1.184)	(1.883)	(0.619)	(0.627)	(0.591)
Kaduna	4.898	5.067	5.423	5.635	5.362	5.391	5.598	5.775
	(1.099)	(1.377)	(1.289)	(1.353)	(0.609)	(0.613)	(0.589)	(0.580)

Kano	5.025 (1.291)	4.984 (1.338)	5.432 (1.396)	5.537 (1.270)	5.735 (1.210)	5.863 (1.390)	5.728 (0.637)	5.912 (0.683)
Katsina	5.023 (1.231)	5.052 (1.309)	5.384 (1.304)	5.591 (1.371)	5.401 (0.750)	5.332 (0.620)	5.614 (0.623)	5.912 (0.683)
Kebbi	5.143 (1.216)	5.084 (1.288)	5.397 (1.185)	5.598 (1.285)	5.308 (0.643)	5.400 (0.649)	5.582 (0.568)	5.790 (0.575)
Kogi	5.098 (1.100)	5.132 (1.180)	5.632 (1.261)	5.777 (1.293)	5.382 (0.624)	5.438 (0.620)	5.651 (0.590)	5.838 (0.598)
Kwara	5.127 (1.302)	5.141 (1.376)	5.481 (1.254)	5.699 (1.344)	5.342 (0.596)	5.464 (0.605)	5.637 (0.578)	5.838 (0.592)
Lagos	5.269 (1.108)	5.361 (1.184)	5.658 (1.233)	5.780 (1.237)	5.355 (0.632)	5.446 (0.619)	5.646 (0.569)	5.793 (0.589)
Nasarawa	5.212 (1.393)	5.158 (1.445)	5.472 (1.284)	5.701 (1.460)	5.398 (0.653)	5.436 (0.616)	5.603 (0.561)	5.885 (0.627)
Niger	5.104 (1.266)	5.131 (1.332)	5.385 (1.180)	5.618 (1.318)	5.383 (0.638)	5.483 (0.618)	5.601 (0.545)	5.782 (0.578)
Ogun	5.128 (1.130)	5.245 (1.246)	5.583 (1.180)	5.730 (1.201)	5.342 (0.601)	5.378 (0.607)	5.582 (0.551)	5.786 (0.569)
Ondo	5.219 (1.234)	5.278 (1.282)	5.514 (1.197)	5.721 (1.238)	5.399 (0.604)	5.461 (0.608)	5.631 (0.575)	5.852 (0.572)
Osun	5.218 (1.301)	5.216 (1.408)	5.465 (1.256)	5.648 (1.301)	5.337 (0.610)	5.456 (0.636)	5.624 (0.551)	5.82 (0.587)
Oyo	5.169 (1.285)	5.175 (1.326)	5.480 (1.231)	5.668 (1.318)	5.368 (0.616)	5.513 (0.627)	5.665 (0.593)	5.811 (0.605)
Plateau	5.177 (1.311)	5.143 (1.411)	5.577 (1.338)	5.669 (1.345)	5.368 (0.643)	5.468 (0.619)	5.714 (0.611)	5.873 (0.631)
Rivers	5.438 (1.186)	5.422 (1.179)	5.633 (1.155)	5.841 (1.242)	5.460 (0.651)	5.530 (0.649)	5.688 (0.604)	5.868 (0.609)
Sokoto	5.371 (1.461)	5.068 (1.119)	5.454 (1.155)	5.652 (1.307)	5.353 (0.616)	5.433 (0.649)	5.593 (0.576)	5.737 (0.554)
Taraba	4.822 (1.225)	5.172 (1.375)	5.336 (1.136)	5.609 (1.281)	5.450 (0.614)	5.406 (0.653)	5.624 (0.609)	5.762 (0.579)
Yobe	5.023 (1.138)	5.105 (1.238)	5.420 (1.242)	5.711 (1.400)	5.391 (0.617)	5.482 (0.654)	5.581 (0.586)	5.730 (0.516)
Zamfara	5.101 (1.292)	4.993 (1.273)	5.354 (1.200)	5.604 (1.343)	5.312 (0.618)	5.188 (0.830)	5.631 (0.621)	5.852 (0.624)
Federal Capital Territory/Abuja	5.133 (1.265)	5.252 (1.368)	5.585 (1.317)	5.769 (1.443)	5.372 (0.642)	5.578 (0.643)	5.678 (0.611)	5.810 (0.599)
National	5.195 (1.171)	5.222 (1.219)	5.496 (1.155)	5.585 (1.161)	5.408 (0.604)	5.467 (0.606)	5.651 (0.541)	5.818 (0.534)

Source: Author's estimations.

Note: Prices are expressed in nominal terms. Nominal domestic prices are the unit values that were sourced from NBS commodity prices and averaged across the states. Variances are shown in parentheses. Rice, maize, sorghum, chicken, soya beans, meat, fish, groundnut, oranges, and shrimps were used for agricultural commodities, while manufactured products consist of processed items.

Table A2 Overview of results, 2006–2011 (per cent)

	Pass-through	Income share		Expenditure share		Changes in real income due to		Overall changes in real income due to the CET
	Agriculture	Agriculture	Manufacturing	Agriculture	Manufacturing	Agricultural sales	Consumption expenditure	Total
North-Central	–	**7.3**	**72.5**	**62.8**	**36.4**	**–1.8**	**11.5**	**9.7**
Benue	44.07	23.03	69.82	60.87	38.19	–7.99	21.11	13.12
Kogi	43.98	4.43	81.79	67.86	31.67	–1.48	22.72	21.23
Kwara	46.40	13.09	83.12	66.68	32.56	0.00	0.00	–0.41
Nasarawa	44.30	0.04	45.57	69.66	29.79	0.00	8.39	8.38
Niger	45.45	0.02	90.22	66.06	33.55	0.00	2.56	2.56
Plateau	50.22	2.20	56.42	59.07	39.69	–0.70	18.73	18.03
Federal Capital Territory	47.10	3.48	55.42	46.05	52.62	–0.26	3.40	3.14
North-East	–	**17.1**	**73.7**	**66.9**	**31.8**	**–4.4**	**15.5**	**11.1**
Adamawa	51.99	27.13	72.86	64.72	34.63	–8.80	20.98	12.19
Bauchi	56.08	2.72	74.80	64.2	32.87	–0.36	8.49	8.13
Borno	141.49	20.11	76.31	74.23	24.87	–4.39	16.20	11.81
Gombe	88.4	27.7	55.60	63.75	35.88	–5.75	13.25	7.49
Taraba	53.97	25.58	58.35	79.89	18.70	–7.23	22.58	15.35
Yobe	86.38	7.26	92.72	53.66	45.89	–1.70	13.90	12.02
North-West	–	**9.3**	**75.5**	**71.0**	**28.5**	**-0.4**	**11.9**	**10.2**
Jigawa	77.25	7.33	79.20	66.76	33.11	-0.70	6.39	5.69
Kaduna	52.19	14.49	66.33	66.10	33.10	–3.42	15.58	12.16
Kano	71.16	6.17	73.94	78.12	21.47	–1.03	13.02	11.99
Katsina	74.59	0.02	86.86	59.58	40.16	0	11.66	11.65
Kebbi	54.80	14.88	85.07	76.59	22.49	–1.00	5.14	4.14
Sokoto	62.72	21.88	70.53	67.18	32.67	–6.93	21.29	14.35
Zamfara	59.78	11.40	60.87	87.34	11.81	1.40	10.76	9.36
South-East	–	**15.4**	**65.6**	**58.1**	**40.6**	**–0.9**	**2.9**	**2**
Abia	56.17	1.98	66.78	52.22	46.03	–0.07	1.95	1.88
Anambra	13.13	24.36	66.9	62.68	36.49	–0.67	1.73	1.06
Ebonyi	48.69	0.01	79.1	36.58	63.01	0	0.35	0.35
Enugu	44.49	12.82	56.65	54.96	42.14	–0.28	1.21	0.93
Imo	58.06	24.85	58.92	72.18	26.41	–2.52	7.32	4.80
South-South	–	**12.6**	**61.7**	**59.8**	**39.0**	**-3.3**	**11.8**	**8.4**
AkwaIbom	55.44	10.89	32.41	59.21	38.90	–1.98	10.75	8.78

	Pass-through	Income share		Expenditure share		Changes in real income due to		Overall changes in real income due to the CET
	Agriculture	Agriculture	Manufacturing	Agriculture	Manufacturing	Agricultural sales	Consumption expenditure	Total
Bayelsa	57.53	49.1	44.38	64.28	33.83	−24.81	33.16	8.35
Cross River	52.54	15.43	84.59	61.39	36.61	−2.19	8.70	6.51
Delta	51.86	17.97	82.01	61.06	37.92	−3.29	11.19	7.90
Edo	46.82	1.61	81.54	63.81	35.52	−0.28	11.14	10.86
Rivers	65.37	4.18	53.76	55.34	44.17	−0.70	9.22	8.53
South-West	–	**8.6**	**81.1**	**56.7**	**42.1**	**0.1**	**1.4**	**1.6**
Ekiti	47.18	13.13	75.98	56.55	41.98	−0.36	1.54	1.18
Lagos	65.26	0.27	89.1	51.37	47.61	−0.04	7.27	7.23
Ogun	57.97	0.03	81.72	53.3	44.16	0	2.61	2.61
Ondo	48.14	20.21	78.36	65.00	34.09	−0.54	1.73	1.19
Osun	49.38	14.36	77.43	58.80	39.45	1.04	−4.24	−3.21
Oyo	54.50	8.06	79.02	56.07	42.6	0.03	−0.23	−0.20
National	**59.9**	**11.7**	**71.6**	**62.2**	**36.7**	**−1.9**	**8.9**	**6.9**
Rural	–	**24.9**	**59**	**79.5**	**19.1**	**−7**	**22**	**15**
Urban	–	**11.7**	**71.9**	**61.6**	**37.1**	**−1.8**	**8.6**	**6.8**

Source: Author's calculations.

Figure A1 Geopolitical zones of Nigeria
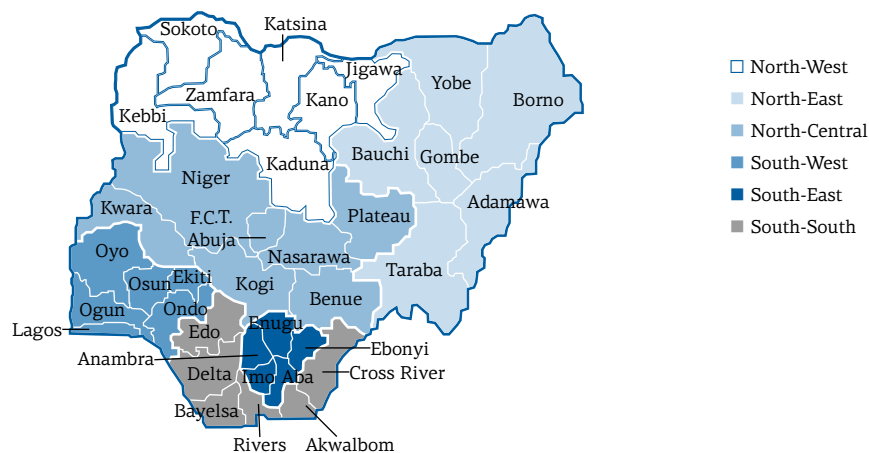
Source: Nairaland, available at: http://www.nairaland.com/359384/scrap-36-states-now-anyaoku/3.

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