DOMESTIC DEMAND-LED GROWTH AND HOUSEHOLD WELFARE IN NIGERIA: A COMPUTABLE GENERAL EQUILIBRIUM APPROACH

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ABSTRACT

Given that the policy target of restricting imports through tariffs system and diversifying the Nigerian economy from an import dependent is consistent with the policy options of the domestic demand-led growth strategy, this study investigates the impact of the domestic demand-led growth strategy on household welfare in Nigeria using a Computable General Equilibrium (CGE) model. The study formulated two scenarios; a protectionist trade policy and a trade liberalization policy, under which 70% increase in import tariffs and 15% increase in import tariffs respectively were simulated. The results of both simulations indicate a fall in income, savings and utility of rich and poor households. Similarly, the results show that both rich and poor households lose welfare with protectionist and liberal trade policies. However, the biggest loss in household and social welfare occurs with a 70% increase in import tariffs which would likely promote aggregate domestic demand and improve households' welfare.

KEY WORDS: Household, Welfare, Demand-led; CGE

JEL Codes: F16; C68; I3

1. INTRODUCTION

The global debate on the choice of an appropriate development strategy has been changing profoundly during the last few decades. In the mid-1970s and 80s there was a policy-switch towards an Export-Led Growth (ELG) strategy in several countries, including those in Asia and Africa (Chigusiwa, Bindu, Mudavanhu, Muchabaiwa, & Mazambani, 2011). This strategy was centered on re-orienting the structure of domestic production to promote exports. Based on the neoclassical principles of 'efficient allocation of resources' between sectors, it was envisaged that exports would act as the engine of growth and stimulate domestic demand which would encourage savings and capital formation. The strategy allowed development to transmit through the external sector channel and export took the lead (Mohanty, 2012). The Nigerian government in 1986 adopted export oriented development strategy known as Export Incentives and Miscellaneous Provision Decree No. 18 of 1986. The aim was to encourage non-oil export, stimulate foreign exchange earnings capacity and diversify the productive base of the economy

in order to achieve a favourable balance of payment. Itegbe (1989) described this decree as a "watershed" in the history of non-oil export development in Nigeria with export expansion and diversification strategy becoming a national policy.

However, the structure of the Nigeria's export trade is still dominated by crude oil exports. For instance, crude oil exports accounted for about 58.51 USD in 2018, representing 92.56% of total exports (Central Bank of Nigeria, 2018). Furthermore, the incessant shocks in the global price of oil due to buoyant oil production, including the US shale oil production; weakening energy demand from developed and emerging markets; and the gradual transition from oil driven economies to none oil economies, has left most of the oil exporting nations including Nigeria with no other option than to grow their domestic demand. Similarly, with the rising levels of poverty, increase in the rate of unemployment in Nigeria (from 6.40% in 2015 to 23.10% in September 2018) (NBS, 2018) and increase in the rate of inflation (from 9.2% in April 2015 to 11.38% in September 2018) (CBN, 2018), which may have eroded purchasing power and reduce personal wellbeing, the 'high growth profile' of the export-led growth as a credible strategy for enhancing growth and economic welfare is therefore called to question and its efficacy comes under scrutiny. Also, the seemingly inconsistent and the poor performance of some of the sectors such as industrial, educational, agricultural and household sectors during the period of the policy raised doubts about the relevance of the export-led growth as a growth stimulating strategy for Nigeria. This therefore calls for a shift in focus towards a domestic demand-led strategy which implies developing a strategy that focuses on enhancing the domestic productive capacity of an economy that complies with effective demand.

The imperativeness to undergo a transformation to an economy driven by domestic demand is underscored by the fact that, despite decades of increasing economic growth fuelled by export-led growth, Nigeria still lags behind on human development and competitiveness indicators and it is still import dependent. Similarly, Nigeria's over dependence on oil revenues for its economic growth and government budget makes it highly vulnerable and susceptible to oil price volatility. It is worthy of note that, the Nigerian government's policy targets of restricting imports through tariff system, rebalancing tax structures (broadening the tax base and maintaining a discriminatory personal income tax system), building social safety nets, increasing public infrastructure investments and adopting a system of flexible foreign exchange rates (dirty float) agree with the tenets of the Domestic Demand-led Growth (DDLG) strategy. This suggests that the Nigerian economy is already on track with the DDLG strategy. However, while the link between domestic demand-led growth and economic growth has received considerable attention in literature (Wong, 2010; Ketebo, 2012; and Soressa, 2013), the household welfare impact or distributional effect of the policy remains under-researched. More so, since this policy is a deviation from export-led growth strategy which has been in practice for decades in Nigeria, it is not clear whether it has the capacity to improve the general wellbeing of the people and the overall standard of living in the country or not. These therefore highlight the need to investigate

the impact of the policy option (import restriction) on household welfare using a computable general equilibrium model to simulate the various scenarios that will results from the imposition of shocks on import tariff to see the resultant impact on household welfare in Nigeria.

The rest of the paper is presented as follows; section 2 deals with the literature review, section 3 focuses on the data and methodology of the study while the empirical results and conclusion and policy recommendations are presented in sections 4 and 5 respectively.

2. LITERATURE REVIEW

Domestic demand according to Mohanty (2012) is the sum total of private investment, government expenditure and gross fixed capital formation. Corroborating this assertion, Joseph and Lim (2005) identified some of the factors contributing to domestic demand are private investment, government expenditure, consumption, and gross fixed capital formation. Under the Domestic Demand-led Growth strategy, expansion in the components of domestic demand which include import restriction would lead increase in domestic production and improvement in the general wellbeing of the people and in particular, household welfare.

Broadly, social welfare or simply welfare is seen as the level of prosperity and standard of living of either an individual or group of persons. In the field of economics, it specifically refers to the utility gained through the achievement of material goods and services. The welfare of a household is measured using income of the households, consumption or expenditure of the households, savings of the households and equivalent/compensating variations. The concept of equivalent variation (EV) is attributed to John Hicks (1939). It measures change in wealth, at current prices, that would have the same effect on consumer welfare as would the change in prices, with income unchanged. It is a useful tool when the present prices are the best place to make a comparison. According to Keshab (2001), general equilibrium solutions are used to compute equivalent or compensating variations in consumer welfare from given changes in policy regimes. In this study the overall welfare is measured using the Hicksian Equivalent Variation in line with the studies of Iorember and Gylych (2018), Abachi and Iorember (2017), Obi-Egbedi et al (2013) and Olopoenia and Aminu (2007).

Brief Review of Previous Studies

Okodua and Alege (2014) in a study on Household welfare impact of trade liberalization in Nigeria examined the various household welfare scenarios that will result from the imposition of shocks on import taxes in the Nigerian economy. The study utilized the computable general equilibrium model based on a 2006 social accounting matrix (SAM) for Nigeria and found that a policy of full or partial trade liberalization of the Nigerian economy will on overall, have a mixed welfare implications for the Nigerian households in the short run. While the policy leads to a general improvement in consumption of goods and services as well as in real income of all households, it at the same time hurts households by inducing unemployment in the two key sectors of agriculture and industry. Similarly, Obi-Egbedi, Okoruwa, Aminu and Yusuf (2012) in

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a study on the effect of trade policy on household welfare in Nigeria using static general equilibrium model, assessed the effect of rice trade policies of an import ban, 80% tariff increase, 5% tariff reduction and 0% rice import tariff on the welfare of households in Nigeria. Simulation results showed that no rice trade policy improved social welfare, although producing households' incomes increased under protectionist policies of ban and tariff increase. In another study, Rahman (2014) employed a CGE model to analyse the impact of trade liberalization on poverty reduction in Bangladesh. The major findings of the two simulation results showed that under the complete abolition tariff rate, exports of all sectors increase significantly thereby leading to improvement in the households' welfare.

Further, Islam and Hossain (2015) investigated the causal relationship between domestic demand, export and economic growth over the period 1971-2011 in Bangladesh. Using cointegration and error-correction mechanism techniques on data pertaining to Bangladesh's final household consumption and government consumption as a measure of domestic demand, real exports, and real GDP, the study found that final household consumption, final government consumption and export have positive effect on economic growth both in the short-run and longrun. Also, Soressa (2013) in a study on export, domestic demand and economic growth in Ethiopia aimed at finding a causal relationship between exports, domestic demand and economic growth in Ethiopia using time series data over the period 1960 to 2011. Employing Granger causality and Johansen cointegration tests the results show that domestic demand is important for economic growth and economic growth has an impact on exports and domestic demand in Ethiopia. Chimobi and Uche (2010) examined the relationship between export, domestic demand and Economic growth in Nigeria using time series data over the period 1970-2005. Employing Granger causality and co-integration tests, the study found that economic growth Granger causes both export and domestic demand while government consumption is caused by export. In addition, their result revealed bidirectional causality between export and household consumption. They argued that domestic demand is a genuine tool that encourages Nigerian economy and should be promoted.

3. METHODOLOGY

Theoretical Model

The theoretical underpinning of welfare impact of an economic policy, such as domestic demand expansion, is found in the utility theory which posits that a consumer is assumed to be rational and therefore spends his income in a way that gives him highest welfare; the theory is useful in the estimation of the welfare impact of the policy change (Iorember & Gylych, 2018). In addition, the general equilibrium theory, explains a condition in which both commodity prices and factor prices are simultaneously in equilibrium in the various markets; the general equilibrium theory addresses the economy-wide perspective of the study and as well forms the bedrock for the methodology of the study (Iorember & Gylych, 2018 and Abachi & Iorember,

2017). This study therefore adopts the Computable General Equilibrium (CGE) model which according to Obi-Egbedi et al. (2012) is appropriate in analyzing household wefare impact of an economic policy. The CGE model belongs to a category of multisectoral models. It is useful in carrying out economy-wide impact of specific economic policies (Adenikinju, Falokun, Aminu & Fowowe, 2012). CGE model represents a vast improvement over highly simplified models that are not able to capture both direct and indirect effects of specific policy measures (Iqbal & Siddiqui 2001).

Model Specification

The structure of the CGE model used in this paper follows the work of Dervis, de Melo and Robinson (1982) and its application to Nigeria by Olofin, Adenikinju and Iwayemi (2003); Obi-Egbedi, Okoruwa, Aminu and Yusuf (2012); and Iorember and Gylych (2018). The functions used are constant elasticity of substitution (CES) of both the Cobb- Douglas and the Leontief types, where inputs are used in fixed proportion. We assume a simple Cobb-Douglas production function to represent value added in each sector. Output produced in each sector comprises value added which is a function of two main inputs: (labour and capital) and intermediate inputs which are derived from inter-sector input demand and from the external market, similar to the study of Iorember and Gylych (2018) and Obi-Egbedi et al. (2012).

The model consists of five aggregated activity sectors of the Nigerian economy; agricultural sector, manufacturing sector, mining and oil sector, utility and telecommunications sector, and services sector. These sectors produce different goods which are either consumed domestically or exported. Also included in the model is a dichotomized households; rich and poor households (*HHYh*) who earn their income from labor and capital employed in the production and is a function of labour supplied at the ruling wage rate (*W*) and capital stock of the households at the ruling price of capital (*PK*) and depreciation rate (*depr_i*). Households income is thus stated in equation 1 below;

$$HHY_{h} = \sum hfyls_{hi}(LAB_{i}W) + \sum hfyks_{hi}CAP_{i}PK_{i}(1-depr_{i}) - - - - - - 1$$

Where $hfyls_{hi}$ is the share factor income from labour received by households *i*, $hfyks_{hi}$ is the share factor income from capital received by household *i* and $depr_i$ is the depreciation rate in sector *i*. Households spend their income on goods produced by the sectors including their imports competing commodities. However, imports and domestic demand are assumed to be imperfect substitutes in line with the Armington assumption. Hence, the quantity of composite commodity *i* consumed by household *h* HEXPQ_(h,i) is given by

Where $h \exp s_{hi}$ is the expenditure is share for households h on goods from sector i and PQ_i is the price of composite commodity in sector i. Each household maximizes a Cobb-Douglas utility function subject to their income thus the household utility HHU_h is given by

Household savings SAV_h are specified as the difference between household income and its expenditure while total household savings of all the households HSAV is obtained from the sum of the savings of each household put together (Olofin, Adenikinju and Iwayemi (2003).

$$SAV_{h} = HHY_{h} - \sum h \exp s_{i} HHY_{h} - \dots - 4$$
$$HSAV = \sum SAV_{h} - \dots - \dots - 5$$

The evaluation of the effects of increases in import tariff on households' welfare in terms of utility gained or lost is analysed using the Hicksian Equivalent Variation (EV). The EV formula is expressed as;

$$EV^{h} = \left[\frac{U_{n}^{h} - U_{o}^{h}}{U_{o}^{h}}\right]Y_{o}^{h} - \dots - 6$$

Where Y_0^h is income of household *h* before policy change, U_0^h is utility of household *h* before policy change, U_n^h is utility of household *h* after policy change and EV^h is the Equivalent Variation of household *h*. A policy is said to have effect on households if the calculated value of the equivalent variation (Hicksina coefficient) is greater than zero (i.e, if EV > 0). The greater the value of the equivalent variation, the more impactful the policy is to the households (Abachi and Iorember, 2017).

Source of Data

The main source of data for this study is the updated Social Accounting Matrix (SAM) constructed from (i) 2004 Input-Output Table for Nigeria (ii) Sectoral output data for year 2016 reported by the Central Bank of Nigeria (2016) (iii) household income and expenditure data for Nigeria (National Bureau of Statistics, 2016). The SAM has two households namely: rich and poor households. The rich households are owners of capital and are predominantly urban households while the poor households are working people believed to be largely rural farmers and urban poor. Shares of household income and expenditure are obtained from the Nigerian Living Standard Survey for 2016.

Simulation Designs

To achieve the objectives of the study, two policy scenarios representing protectionist and liberalization tariff policies were formulated and simulated. The protectionist policy scenario involves raising the base-year value of import tariff by a magnitude as high as 70% to discourage

imports and raise aggregate demand for domestically produced goods, while the liberalization policy scenario consists of a small increase of 15% in import tariffs which is about 5% higher than the average increase from 2013 to 2016 (World Bank Development Indicators, 2018). This entails that, if government increases tariffs on imports of foreign goods, the relative price of domestic goods is lowered below the word price. This raises the price of both the imported commodities and the import-competing commodities and results in a price increase which creates an incentive for domestic production of the importables (Obi-Egbedi *et al* 2012). Thus the increase in tariff results in: *a production effect* – producers shift towards the production of the importables; *government-revenue effect* – government revenue increases due to tariff collection; and *the welfare effect* – society may lose or gain welfare as it moves to a different indifference curve.

4. RESULTS AND DISCUSSIONS

Table 1 presents results of the baseline and counterfactual simulations for the two categories of households (rich households and poor households) with the corresponding percentage changes. The baseline simulation refers to the do-nothing. That is the simulation outcomes before policy change, while the counterfactual simulations are the simulations of the two policy options of domestic demand growth (i.e increase in import tariffs by 70% and 15% respectively).

The baseline simulation reveals that rich households' incomes, savings and marginal utility stood at 85.33%, 351.95% and 4.61% respectively of total percentage, while poor households' income, savings and marginal utility accounted for 14.67%, -251.95% and 95.39% respectively of the total respectively. This entails that rich households earn higher incomes than poor households and saves more than poor households, while poor households on the other hand achieve higher marginal utility (financed largely from dis-savings) than rich households. These findings are consistent with present day economic reality in Nigeria. Figures 1 and 2 shows the percentage change in rich and poor household income, savings and utility from the baseline for simulation 1 and 2 respectively.

Figure 1 reveals that both households (rich and poor) are better worst off with a 70 per cent increase in import tariffs. Under this scenario, rich households (RHH) income and savings decrease by 80.86 per cent with a 24.02 per cent decrease in marginal utility while poor households (PHH) income and savings decrease by 78.74 per cent with 20.47 percent decrease in marginal utility. Under the second simulation (15% increase in import tariffs), rich households' income, savings and marginal utility decrease 6.15%, 6.15% and 0.33% respectively while poor households' income, savings and marginal utility decrease 6.15%, 6.15% and 0.33%, 8.33% and 1.02% respectively. Notably from the results is that even though both households suffer income, savings and utility losses in the two scenarios, rich households suffer more with 70% increase in import tariffs while poor households suffer more with 15% increase in import tariffs. This finding can be explained by the fact that rich households depends on imported goods more than poor households. Therefore, a policy that seeks to drastically discourage imports will be more harmful

to rich households than poor households who are just consumers of basic imports. Similarly, a policy that seeks to liberalize trade will obviously be more beneficial to rich households than poor households.

	Baseline		Simulation 1		% Change from		
					the baseline		
Panel A:	70% incre	70% increase in import tariffs (Protectionist policy)					
	RHH	PHH	RHH	PHH	RHH	PHH	
	7499.102	1289.278					
HHY	(85.33)	(14.67)	1435.599	274.0567	-80.8564	-78.7434	
	5726.219	-4099.23					
HSAV	(351.95))	(-251.95)	1096.204	-871.356	-80.8564	-78.7434	
	1.45871	30.20616					
HHU	(4.61))	(95.39)	1.0972	24.02202	-24.7829	-20.4731	
	Denska						
	Docolino		Simulatio	n)	% Chang	ge from	
	Baseline		Simulatio	n 2	% Chang the baseli	ge from ne	
Panel B:	Baseline 15% Increa	se in import tai	Simulatio riffs (liberal	n 2 ization policy)	% Chang the baseli	ge from ne	
Panel B:	Baseline 15% Increa RHH	se in import tai PHH	Simulatio riffs (liberal RHH	n 2 <i>ization policy)</i> PHH	% Chang the baseli RHH	e from ne PHH	
Panel B:	Baseline 15% Increa RHH 7499.102	<i>se in import tar</i> PHH 1289.278	Simulatio riffs (liberal RHH	n 2 <i>ization policy)</i> PHH	% Chang the baseli RHH	e from ne PHH	
Panel B:	Baseline 15% Increa RHH 7499.102 (85.33)	se in import tan PHH 1289.278 (14.67)	Simulatio riffs (liberal RHH 7037.809	n 2 <i>ization policy)</i> PHH 1181.937	% Chang the baseli RHH -6.15132	e from ne PHH -8.32571	
Panel B:	Baseline 15% Increa RHH 7499.102 (85.33) 5726.219	<i>ese in import tar</i> PHH 1289.278 (14.67) -4099.23	Simulatio riffs (liberal RHH 7037.809	n 2 <i>ization policy)</i> PHH 1181.937	% Chang the baseli RHH -6.15132	e from ne PHH -8.32571	
Panel B: HHY HSAV	Baseline 15% Increa RHH 7499.102 (85.33) 5726.219 (351.95))	<i>se in import tar</i> PHH 1289.278 (14.67) -4099.23 (-251.95)	Simulatio riffs (liberal RHH 7037.809 5373.977	n 2 <i>ization policy)</i> PHH 1181.937 -3757.94	% Chang the baseli RHH -6.15132 -6.1514	e from ne PHH -8.32571 -8.32571	
Panel B: HHY HSAV	Baseline 15% Increa RHH 7499.102 (85.33) 5726.219 (351.95)) 1.45871	<i>ese in import ta</i> PHH 1289.278 (14.67) -4099.23 (-251.95) 30.20616	Simulatio riffs (liberal RHH 7037.809 5373.977	n 2 <i>ization policy)</i> PHH 1181.937 -3757.94	% Chang the baseli RHH -6.15132 -6.1514	e from ne PHH -8.32571 -8.32571	

Table 1: Results of the Baseline and Counterfactual Simulations

Source: Authors' computation using GAMS 28.4. Note: RHH and PHH denote rich and poor households respectively; HHY, HSAV and HHU stand for households' income, households' savings and households' utility. Values in parentheses are percentages of totals



Figure 1: Impact of a policy change (70% increase) in imports

Figure 2: Impact of a policy change (15% increase) in imports



The analysis of welfare gains or loss (welfare effect) was carried out using the Hicksian Equivalent Variation (EV) and the results presented in Table 2. The results indicate that both rich households and poor households will loss welfare if the domestic demand led growth strategy is pursued through import tariffs manipulation. For the both cases (70% and 15% rise in import tariffs), the values of the Hicksian EV is negative, suggesting welfare loss. However, the magnitude of the loss is more with the protectionist policy. Overall, none of the domestic demand led policies improves social welfare. This finding is consistent with the findings of Okodua and Alege (2014) and Obi-Egbedi *et al* (2012) who found that high import tariffs hurt households and do no improve social welfare in Nigeria.

	EV from 70% increase in import tariffs (protectionist policy)	EV from 15% increase in import tariffs (liberalization policy)
Rich Households	-1859.64	-24.68
Poor Households	-263.94	-13.16
Social Welfare	-2123.58	-37.84

 Table 2: Effect of increase in import tariffs on Households welfare (Nbillion)

Source: Authors' computation using GAMS output

Note: Social welfare is the sum of all households (rich and poor) welfare

5.0 CONCLUSION AND POLICY RECOMMENDATIONS

The study investigated the effect of domestic demand-led growth on households' welfare in Nigeria by simulating protectionist and liberalization trade policies. The results of both policies indicate a fall in income, savings and utility of the rich and poor households. Similarly, the results show that both households lose welfare with protectionist and liberal trade policies. However, the biggest loss in households and social welfare occurs with a 70% increase in import tariff. This further implies that domestic demand led growth via trade policies may not yield the desired outcomes. Therefore, the study recommends a less than 15% increase in import tariffs which is likely to promote aggregate domestic demand and improve household welfare.

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