The Impacts of Trade Liberalization on Poverty in Nigeria: Dynamic Simulations in a CGE Model

Final Report to the Poverty and Economic Policy (PEP) Research Network

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Abstract

The study examines the effects trade liberalisation will have on poverty in Nigeria. Previous studies have been limited by static analysis and partial equilibrium analysis. We use a Dynamic Computable General Equilibrium Model to analyse this issue. The positively affected sectors are capital intensive therefore ccapital income improves over time while land and labour income reduce. This has positive implications for urban households and negative for rural households due to the dependence of the later on mostly land and labour income. As a result, urban poverty decreases in the short and long run while rural poverty increases in both periods. For trade liberalization to have a pro-poor effect, policies to improve the agricultural sector will have to be implemented before or concurrently with it. In this way the rural areas which obtain most of their income from this sector will respond more positively to trade liberalization.

Keywords: CGE Model, Trade liberalisation, Nigeria, Poverty, Dynamic, ECOWAS, Import tariffs

JEL Classifications: D58, F13, I32, C68

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1. INTRODUCTION

The study examines an aspect of Nigeria's interaction with the global economy that can have appreciable effects on its poverty alleviation drive: its trade liberalisation. Nigeria is rich but its people are poor (World Bank [1996]). This irony has made it imperative to asses the poverty implications of the government's activities. A greater urgency should be brought into this issue as the population of poor people is almost steadily growing: between 1980 and 1996 the population of poor people (living below the poverty line) increased from 27% [18 million] to 66% [66 million] of the population (DFID [2000]). Furthermore, the severity of poverty more than doubled from .08 in 1980 to .207 in 1996 (Federal Office of Statistics [1999]).Thus the unfortunate trend of rapidly growing population of poor people is further exacerbated by the worsening of the conditions of living of poor people i.e. the poor are becoming poorer than they used to be. Poverty is caused by both microeconomic and macroeconomic as well as sociocultural factors. We primarily aim to asses the possible role of a macroeconomic factor in poverty dynamics.

For some years the Government of Nigeria has been going through the process of adopting the ECOWAS[1] Tariff rates in line with the Trade liberalisation scheme (TLS). The TLS, as part of the efforts aimed at promoting economic integration of the West African sub-region , involves removing tariffs on intra-ECOWAS trade and establishing a Common External Tariff (CET) with other ECOWAS countries [2].Other groups and agreements also call for a reduction of tariffs (as well as non-tariff barriers to trade) by Nigeria and other countries. These include the African Caribbean Pacific-European Union agreement, International Monetary Fund, World Bank, World Trade Organisation etc. These changes bring up the following questions:

[1] Economic Community of West African States

[2] Hence forth and for our purposes the term trade liberalisation is defined by this statement and will be used interchangeably with the term tariff reduction. The adoption of the ECOWAS rates requires a reduction in the range of tariffs and would lead to a lower weighted average tariff.

- Will national poverty level rise as a result of trade liberalisation? As at June 2004, Nigeria's import tariffs ranged from 0 to 150% while most ECOWAS countries had tariffs less than 20% (IMF [2005]). What will be the effect of the lower tariffs required by agreements with ECOWAS and international bodies? Specifically what would be the effect of a 0-20% tariff range?
- Which socio-economic groups will be most affected by the liberalisation?
- Which sectors will be most affected by the liberalisation[3]?

Answering these questions will provide guidance on how trade liberalisation can be made pro poor. Accordingly, the main objective of the study is to investigate the effects of trade liberalisation on poverty and income distribution in Nigeria. The rest of the paper is organized as follows. Section 2 discusses possible channels through which trade liberalisation may affect poverty in Nigeria. Section 3 describes the methodology used in the study while section 4 discusses the results of the policy experiment. Finally, section 5 concludes the paper. The annex contains further background details and more information on the model and results from the analysis.

[3] The Manufacturers Association of Nigeria, in particular, has repeatedly called for caution in the implementation of the scheme as it opined that the possibility of negative effects is strong.

2. TRADE LIBERALIZATION, GROWTH AND POVERTY IN NIGERIA

Trade Liberalization (tariff reduction) will affect poverty mainly through its impacts on government revenue, the prices of products and the income of households[4]. When tariffs are lowered government import tax revenue is reduced [Kuji et al (2002)]. As the government's ability to render service depends on its revenue, this will negatively affect government's capital and recurrent expenditure. Transfers and other social expenditure may be affected. However in Nigeria's case, the reduction in total government revenue will not be so large as import tax revenue is usually about 10% of total tax revenue.

The second channel is through the prices of products. Imported products will become cheaper and hence relatively more attractive than domestic goods. Kuji et al calculated price elasticities of imports and confirm that they are negative. Imports will increase and will compete more with domestic production. Trade Liberalization will further spur growth of imports as imports ordinarily increase with increases in GDP as a result of the marginal propensity to import. So imports will increase as GDP increases annually. Here we assume that GDP maintains the positive trend it has been showing in the last few years.

Soludo and oji (2003) state that with the reduction of import tariffs over the years "the composition of effective demand shifted towards imports: this was triggered by the cheapening of imported goods and expansion of domestic credit supply". This agrees with the observed preference for imported products and existing propensity to import. With the successive reduction of tariffs, the ratio of imports to GDP rose from 18% in the 1978 to 1985 period to 26% in the 1995 to 2002 period indicating a shift to imports demand vis-à-vis domestic goods. This is an indication of the propensity to import.

The third channel builds on the price effects. Household income and consumption is affected by the changes in prices. For households that obtain labour or profit income from domestic production of liberalized products a fall in income is expected. Akinsoye et

[4] For a more detailed review of Nigeria's experience with Trade Liberalization see Nwafor (2005).

al (1998) state that ' the appreciation of the Naira exchange rate cheapened food imports and consequently helped to depress domestic prices thereby constituting serious disincentive for increased domestic production'. Reducing tariffs will have the same effect, as the price elasticities of imports are still negative [Kuji et al (2002)]. At the same time the reduction in the prices of imported goods makes more consumption possible for the household. Olofin et al (2001) arrived at this same result in their analysis.

They use a CGE model based on 1999 data to assess the impact of 50% reduction of all tariffs[5]. The net effect on a household will then depend on weather the household is a net consumer or producer of the products in question .For the economy as a whole, the final price (and therefore income) effects depends on how the intersectoral relationships mould equilibrium prices . [6] The final effect on the entire economy in turn determines the final effect on all households**.**

The effect on average income of households will off course be determined by the effect on GDP. Olofin et al (2001) found out that real GDP would increase by .11% if all tariffs are reduced by 50%. This thereby reduces weighted average tariffs. The average price level falls but real income falls as well. This might have been due to a greater fall in nominal income. In their analysis one household was used so it is difficult to ascertain the destination (i.e.-rural or urban) of the increased income from increased real GDP as average real income decreased. This highlights the need for more policy relevant households.[7] Moreover there is reason to expect that the impact on urban households may be different from that on rural households as their income and expenditure patterns are different. We can conclude from their study that the effect of a decrease in Nigeria's weighted average tariffs on real GDP is slightly positive in the short run.

[5] It is unclear if these are actual or expected tariffs.
[6] Because of the importance of intersectoral relationships studies which focus on one sector, though useful for obtaining some partial equilibrium estimates, cannot be used to generalise with respect to economy wide variables. These include Okunmadewa (1999), Ogundele (2001) and Kuji (2002).
[7] Oyejide (1986) assesses the impact of trade liberalization on 3 sectors: non-tradables, importables and exportables but is static in nature and does not have households in the model.

What is not clear is the effect in the long run as well as the different impacts on urban and rural households. It is interesting to note that 1 out of every 3 poor people is a farmer and 7 out of every 10 farmers are poor (Federal Office of Statistics [1999]). As can be expected, farmers are mostly in rural areas. Therefore the impact of tariff reduction on farmers will go a long way in determining the poverty level. Because of the belief that Nigeria can be food self-sufficient, imports on food are discouraged. Some food items are either banned or have high tariffs. Rice imports for example have been banned several times in the last 2 decades. As at June 2004 the import duty on rice was 75%. Unfortunately foreign rice is preferable as it is cleaner than local brands and there is a general preference for imported products. In reaction, government has made final consumer products to have the highest tariffs (1980-date). As at June 2004, the tariff on food ranged from 0-100%. Reducing tariffs to the range of 0-20% will have a relatively higher effect on the food sector and farmers compared to other sectors. This has significant implications for the poverty level.

There is evidence in the literature that the static effects of Trade liberalization can be different from the dynamic effects (Lofgen et al [1999], Dissou [1998]), Annabi et al (2005)). Overtime capital stock and labour supply growth exert upward pressure on GDP so it is expected that these can consolidate the static gains (or reverse the static loss) from trade liberalisation. This argument has been made with respect to Nigeria as a reason for trade liberalisation. However, existing studies do not asses the impacts of these dynamic variables.

3 METHODOLOGY

3.1 INTRODUCTION

To address the issues raised above, we use a Sequential Dynamic Model of the Nigerian economy. It is a variant of the EXTER model [Annabi et al (2004)]. The model

specification is in the Annex[8]. For poverty analysis we use the Top-down representative household approach. The model is a standard CGE model with dynamic equations for modelling capital stock and labour supply. Labour supply, capital stock and the minimum consumption of goods and services by households are dynamic in the present model. It covers the period 1997 to 2012 and uses a 1997 SAM.

In constructing the I-O matrix and the SAM for the study we follow Olofin et al [2001] by basing sectoral classifications on the categories relevant to the government – capital goods, intermediate goods, unprocessed goods and consumer goods. The SAM for the study was based on the 1997 Input-Output and Supply and use table (SUT) by the Federal Office of Statistics (FOS), Nigeria. Table 1 below contains key data from the SAM as well as the elasticities used in the model. 1997 was chosen as the base year because the most recent national consumer survey (whose data was available on time) was conducted in 1996/7. Moreover, the 1996/7 consumer survey was used in the construction of the SUT. The SUT has 33 sectors which were reaggregated into the following sectors in the model.

- agex - Agriculture exports (cash crops)
- agfd - Agriculture (food)
- oil - oil and other mining
- mcons- Manufactured consumer goods
- mint - Manufactured intermediate goods
- mcp - manufactured capital goods
- ser - services

[8] See Annabi et al (2004, 2005) for more detailed discussions on the model.

TABLE 1: KEY SHARES AND ELASTICITIES

	Agric -food	Agric - exports	oil and other mining	manufacturing-consumer	manufacturing - capital	manufacturing-intermediate	Services	Total
Share of total GDP (%)	23	11	30	9	0	21	5	100
Share of total household consumption (%)	22	17	0	13	2	29	18	100
Share of intermediate demand by origin (%)	25	2	11	10	0	27	25	100
Share of intermediate demand by destination (%)	7.9	3.8	6.2	9.6	0.3	21.8	50.4	100
Share of total exports (%)	0.00	0.08	92.69	0.01	1.04	1.55	4.63	100
Share of total imports (%)	7	0	1	7	18	19	47	100
Imports/total supply (%)	5	0	1	8	87	10	23	
exports/gross output (%)	0.00	0.18	84.14	0.02	74.05	1.48	4.59	
Share of investment by destination (%)	3.9	4.3	15.7	20.5	0.4	53.6	1.6	100
Share of investment by origin (%)	2.4	0.4	0.2	29.7	25.7	12.2	29.4	100
share of labour employment (%)	44.30	19.78	11.10	3.37	0.09	7.68	13.67	100
Export demand elasticity	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
Capital/labour elasticity	1.5	1.5	0.1	1.5	1.5	1.5	1.5	
CES elasticity	2.0		2.0	0.9	0.9	0.9	0.4	
CET elasticity		0.4	2.0	0.9	0.9	0.9	0.4	
Rank of rate of return	7	6	1	4	3	5	2	
Share of inputs in gross output (%)	15	15	9	32	32	34	83	
Share of value added in gross output (%)	85	85	91	61	61	66	16	
Share of labour in value added (%)	52	49	10	10	10	10	75	
Share of land in value added (%)	47	49	0	0	0	0	0	
Share of capital in value added (%)	1	3	90	90	90	90	25	

3.2 SALIENT FEATURES OF THE MODEL

PRODUCTION

Production is modelled as a leontiff function of value added and intermediate inputs. Value added is a CES function of labour and capital for non-agricultural sectors and a CES of a composite factor and land for agricultural sectors[9]. The composite factor is a CES function of capital and labour. Capital is modelled as a function of initial net capital stock and investment by destination in the sector. CET and CES parameters were obtained from Dorosh [1996]. Labour supply is modelled as growing by 2.8% per year which is the annual population growth rate in Nigeria.

To reproduce the historical growth rates we introduce an adjustment factor in the production function. The model reproduces the historical growth rates of 1998 to 2004. We observed that the adjustment factor for 1998 to 2004 grew at an average annual rate of 1.76%. We therefore set adjustment factor for 2005 to 2012 to grow as well but at a less optimistic rate of .77% per year[10] which produces growth rates comparable to recent history.

In the oil sector we allow much lower substitution between capital and labour in order to capture the upward trend in both investment and capital stock growth in the sector. In practice this sector usually has more access to investable funds so we reflect this in the model[11] . Without this, labour demand grows at the expense of capital demand.

INVESTMENT BY DESTINATION

Investment by destination was calibrated to equal the total investment by origin. Given the returns to capital in each sector from the SAM, we calculated the structure of investment by destination which would result in the order of returns to capital observed in

[9] We introduced land because the operating surplus in the agricultural sector would erroneously be treated as returns to capital without it. This would also lead to erroneous interpretations of the returns to capital in the investment function.
[10] We might regard this as an indication of total factor productivity (TFP) as it accounts for all other influences on value added. The adjustment factor for 1997 was fixed to 1 in order to reproduce the SAM therefore any interpretation of this factor as TFP would be relative to 1997 TFP level. When the adjustment factor was set to 1 the growth rate was about 4 times higher.
[11] This was suggested by Bernard Decaluwe.

the economy. The oil sector has the highest returns while the agric-food sector has the lowest returns (see Table 1 above). Information on structure of investment by destination and returns to capital was obtained from the UNDP SAM, the Central Bank of Nigeria Annual report (2003a) and the Manufacturing sector survey figures contained in Federal Office of Statistics (2001). Investment by destination is a function of the user cost of capital and the returns to capital.

HOUSEHOLDS

There are 2 households in the model: urban and rural. Household income is made up of wages, profits and returns to land. Trade liberalisation ultimately affects the product and factor markets. These in turn cause changes in the sizes of the above components of household income. Thus through household income, the shock may affect poverty levels.

The poverty line is based on the poverty line used by the Federal office of Statistics, FOS. For the periods 1980 –1996 a real poverty line of N395/person/year (1985 Prices) was established. The Poverty line was defined as 2/3 of the mean monthly household expenditure in 1980. This poverty line was found to provide the minimum 2100 calories per person per day recommended by the Food and Agriculture Organisation. The poverty line for the model is the same as that of FOS. If a household's expenditure per person is below the poverty line that household and its members is grouped as poor.

Data on poverty and household expenditure is from the 1996/7 Consumer Survey. Total population in the survey is 122 Million people with 65.59% living below the poverty line and the gini coefficient was .47. There are 14,951 households in the survey. We use the Top-down representative household approach (Agenor et al [2003], Lofgren et al [2001]) to measure poverty impacts-

First: the survey was sorted into urban and rural households

Second: we generate the growth rates in real income for each household in the 16 years before and after simulation.

Third: we divide this income growth rate by the population growth factor to arrive at the per-capital income for the household in that year and simulation. We assume that population grows at the historical rate of 2.8% per year. This generates the growth rate of per-capita income for each household in each year.

Fourth: these growth rates are applied to the 1997 household survey data to generate the household expenditure per person for 1997 to 2012.

Fifth: Poverty analysis is carried out using the DAD software (Duclos et al [2004]) and sample weights contained in the consumer survey.

Household consumption is modelled with the linear expenditure system (LES). LES parameters were obtained from Dervis et al (1982). Households' income tax is recorded as zero as income taxes have been found to be abysmally low. Minimum consumption of households is modelled to grow at the population growth rate of 2.8% per year. Households save a fixed proportion of their income.

GOVERNMENT

Government revenue is made up of corporate income tax, import tariffs and other indirect tax revenue. Government expenditure is made up of expenditure on the goods (summed up under services) and subsidy. Real expenditure on goods and services is fixed and the subsidy is exogenous in the model. Government savings is endogenous.

FIRMS

Firms earn income from capital and distribute profits to households. They pay corporate income tax to the government and have savings. Firm savings is endogenous.

EXTERNAL TRADE

There are 6 exportable sectors (Manufacturing-capital goods, Manufacturing-intermediate goods, Manufacturing- consumer goods, Services, Agriculture – exports (i.e. cash crops) and oil and other mining. There are 6 import competing sectors (Manufacturing-capital goods, Manufacturing- intermediate goods, Manufacturing-consumer goods, services and agriculture – food crops). For non-oil sectors, domestic consumption specification is based on the armington hypothesis. For the oil sector we assume perfect aggregation between domestic production, imports and exports.

It is through the variation of import tariffs on the 6 importable products (i.e. import competing sectors) that trade liberalisation eventually affects households through (mainly) its impact on the factor and product markets. Export demand elasticities are used to control exports (mainly oil which is over 90% of exports) to reflect the historical growth in exports.[12] The current account balance is exogenous in the model.

DYNAMIC FEATURES

Three features of the model capture how an economy changes overtime. The First is the yearly increase in capital stock. As explained above, capital in a sector increases due to new investment by destination. The second is the increase in labour supply. In a static model, total labour supply is fixed as population is fixed. Though in a static model labour can relocate from one sector to another, the labour force does not increase in size. In this model we increase the total labour force by the annual population growth rate. At the same time labour can also relocate to other sectors. The third dynamic component is the minimum consumption of households. This is increased annually by the population growth rate to reflect the fact that household size increases over time and consequently minimum consumption does as well. The changes in these 3 variables cause the economy

[12] This brings the compound growth rate of oil exports to 5.5% which is close to the historical rate of 4.7% (Federal Office of statistics [2004]).

to change overtime even without policy shocks. This yields the dynamic nature of the model.

MACROECONOMIC CLOSURES

The model is savings driven in the sense that household savings rates and the current account balance are fixed. Government and firm savings are endogenous. Total investment is not fixed but adjusts to equate total savings. Sectoral investment is determined by the investment functions therefore at the sectoral level the model is controlled by investment rather than savings. In other words, individual sectoral investments do not have to vary in the same direction as total savings. The current account balance is fixed in order to reflect the fact that foreign savings cannot be taken for granted in international finance. Indeed for Nigeria, increasing foreign investment has become a major challenge. Household savings rates are fixed as most households are poor and are unlikely to increase savings in order to fund further investment. Firm savings are more likely to account for increases in investment.

EQUILIBRIUM CONDITIONS

The demand for labour = supply of labour

Demand for each composite good=supply of each

Total savings = total investment (by destination and origin)

4. THE POLICY EXPERIMENT

The model analyses the impact of trade liberalisation by assessing, mainly, the poverty effects of Nigeria completely adopting the ECOWAS Common External Tariffs (CET). This would involve carrying out simulations where Nigeria's tariffs are set to the ECOWAS CET rates.

The ECOWAS tariff rates are:

5% for unprocessed raw materials and capital goods

10% for intermediate goods

20% for consumer goods

This would mean setting tariffs in the model as follows:

TABLE 2: IMPORT TARIFFS

Sector	1997(BASE) Tariffs	ECOWAS CET Tariffs	Percentage change
Agriculture exports (cash crops)	Not Imported	Not Imported	Not Imported
Agriculture (food)	14.5%	5%	-66
oil and other mining-	3.4%	5%	45
Manufactured consumer	18.2%	20%	10
Manufactured intermediate	16.7%	10%	-40
manufactured capital goods	2.8%	5%	78
Services	0% (approximation)	0% (approximation)	0
Weighted Average Tariff	6.14%	4.66%	-24

Source: SUT and Kuji et al [2002]

The base tariffs are obtained from the 1997 Supply and Use table (SUT) constructed by the Federal Office of Statistics, Nigeria and the subsequent SAM constructed for the study. They are therefore weighted average tariffs for each sector and the whole economy. The policy experiment in the model is changing these tariff rates to the ECOWAS levels and observing the impacts in the economy over a period of 16 years. The key interest here is to ascertain: whether trade liberalisation will (1) increase the national poverty level in the long run and (2) have substantially different effects on different sectors and households thus leading to some being more affected than others.

From the 1997 SUT, we discovered that actual tariffs were only a third of expected tariffs. Based on the last tariff book (1995-2001), expected weighted average tariff is 17.4% but the actual weighted tariff in 1997 was 6.14% indicating a 35% compliance level. The tariffs have essentially been the same as in the 1995-2001 tariff book. In the simulations we focus on the effects of complete implementation of the ECOWAS tariffs.[13] From 1999 the government embarked on Customs and Port reforms which have

[13] It is not clear what kind of exemptions the government might make. We therefore assess the possible results of complete implementation of the scheme. Eventually, exemptions will depend a lot on how much political voice the interested parties have.

increased the level of inspection at Ports. In the simulations we assume compliance is at a very high level – evasion has and is still being reduced. A complete implementation of the ECOWAS scheme would cause weighted average tariffs of the manufactured capital, manufactured consumer and oil sectors to rise compared to existing levels. While tariffs ranged from 0-150%, the official weighted average tariff was 17.4%. The new trade regime calls for lesser tariffs in the 0-20% range.

The implementation of the ECOWAS tariffs decreases weighted average tariffs from 6.14% to 4.66% and this leads to a decrease in the share of domestic output in aggregate demand as imports become cheaper. Total Imports value increase by .012%. As shown above , the ECOWAS tariff regime increase tariffs on oil , manufacturing(consumer goods) and manufacturing (capital goods) while it decreases tariffs on agriculture(food) and manufacturing (intermediate goods) . In observing the outcomes we regard the effects in 1997 as short run (SR) effects and those of 2012 are long run (LR) effects. We also refer to the simulation of ECOWAS rates as TL- Trade Liberalisation.

Agriculture (food) sector

In the short run, the output of the sector declines due to the 66% decrease in import tariffs and increased competition from imports. Both volume and price of output decline. Also, both value added and output value decrease. Returns to capital and land decrease in the sector. Labour also moves away from the sector as a result of the decline in output. This has been observed in Nigeria whenever cheaper agricultural imports increase.

In the long run the output value and value added of the sector decline by a higher percentage than in the short run. With the new tariff regime, the sector's share of investment by destination decreases due to lower returns to capital. Moreover it has the lowest rate of return in the base year so it is unlikely to attract more investment than other sectors. The investment in this sector is low as many obstacles to commercial farming which uses more capital exist. The sector's share of investment by destination continues

to decline by greater percentages and labour employed is consistently lower during the period. The decrease in investment is expected as the returns to capital are consistently lower in the ECOWAS run.

However, capital stock and labour employed increase during the period but at lower rates than they did in the base run. Returns to labour decrease as they do for all sectors. The continuous decline in the capital stock and labour employed (relative to the base run) cause the sector's output to decline all through the period. In essence there was no stimulus for an increase in output especially with the increased import competition.

Agriculture (Exports)

As there are no imports in this sector (mainly cash crops), the implementation of the ECOWAS rates does not create increased competition from imports. In the short run, the price of output falls due to the general decline in prices but its volume increases. This results in a fall in the value of output and value added. From the demand side the increased volume is caused by the increase in both exports' and domestic demand volume. The sectors' lower price makes its exports more attractive to the world market. From the supply side we observe that labour employment increases as labour from negatively affected sectors like the agriculture (food) sector move to this sector. This increases output volume in the sector. Capital as in other sectors is fixed in the short run. Like the other agriculture sector, the short run effect is a decrease in the value of output. The returns to capital, land and labour also fall in the short run due to the contraction of nominal output.

In the long run the nominal output and value added decrease compared to the base run as they did in the short run. However, output volume decreases as well. With TL, investment relocates to the 2 sectors which have become more profitable through higher nominal output - manufacturing (intermediate goods) and the oil sector- whose returns to capital increase during the period. The capital stock available for production is

therefore less than in the base run. This contributes to a lower output volume though there is still an increase in export volume and indicates that the demand was constrained by supply. Labour employment also decreased in 60% of the duration as output decreased over the years. But in the long run it is slightly higher than base run value. We therefore observe that the short run increase in output volume was reversed due to lower investment in the sector.

Oil Sector

The TL scheme increases import tariffs by 45% and reduces import competition in the sector. Both domestic demand and exports value increase. As weighted average tariffs are reduced, the cost of production in the economy falls and causes a fall in the oil sector's product price. More importantly, the lower price of products makes them more competitive in the domestic and world markets. Exports increase as a result as does domestic demand. Exports are controlled by low elasticities so they remain close to historical levels. The increase in domestic demand consequently exerts an upward pressure on prices so that in the short run, output price, volume and value increase. Value added increases as well. Labour employment increases accordingly as capital is fixed in the short run. The higher value of activity increases the returns to capital.

In the long run the oil sector's share of investment by destination continues to grow as its returns to capital maintains an upward trend. Its having the highest rate of return in the base year, the increase in import tariffs and the fall in production costs combined to make value added in the sector expand. Though the value of output decreases in the long run compared to the base run, value added on the contrary increases. The fall in intermediate inputs cost was larger than the fall in sales so that value added increased. The investment in the oil sector therefore increases compared to the base run. Also, its share of labour increases throughout the period. However the increase in labour employment is not as high as we find in the manufacturing and service sectors which allow

more substitution between capital and labour. Moreover the service sector is more labour intensive.

Manufacturing Sector – Consumer Goods

Increasing tariffs by 10% decreases import competition and the decrease in weighted average tariffs lowers production costs as we saw in the oil sector. The impacts in the short run are as we observe in the oil sector- exports and domestic demand volume increase while import volume decreases. The increase in demand volume is however not strong enough to exert pressure on output so that output value and prices decrease due to the deflationary environment. Value added decreases as well. The decrease in turnover in the sector leads to a decline in the returns to capital. Unlike the agriculture-food sector, the sector does not lose its share of labour employment as its loss of revenue is not as high. We observe that, for sectors with fairly equal labour intensity (manufacturing and oil sectors) the growth in labour employment is proportional to the loss of revenue. Labour lost in the agriculture-food sector is absorbed by other sectors depending on their labour intensity and their degree of loss (or gain) in revenue. Though the sector increases its quantity of output by employing more labour, its turnover decreases due to the deflationary environment. It is able to employ more labour due to the decrease in wage rate and achieves a reduction in its wage bill.

The decline in sales revenue continues in the long run. The decline in returns to capital continues for a short period but switches to an increase for most of the years thus indicating increased profitability of the sector : unlike the 2 agriculture sectors, its returns to capital does not decline throughout the period. However the loss of revenue is strong enough to slow down capital stock growth compared to the base run. Through out the period it employs more labour than in the base run. Though there is a short run decline in its share of investment this is quickly reversed so that its share of investment rises through

out the rest of the period. This is due to an improvement in product prices in the long run so that the decline in nominal output is not as high as in the short run. This translates to a relative improvement compared to the agriculture and service sectors and causes investment to be diverted to this sector and other relatively improving ones. The increase in prices might indicate that the supply for the sector's products was not growing as fast as demand thereby making growth supply constrained. However capital growth is not as fast as in the base run. The TL scheme therefore slows down business activity in the sector in the short run more than it does in the long run.

Manufacturing Capital Goods

The TL scheme increases import tariffs by 78%- from 2.8% to 5%. As with the oil sector, this reduces import competition which is especially high. In the short run, output volume increases while prices decline but at a higher rate so that output value decreases. Prices decline due to the deflationary environment. Returns to capital however, increases due to improved value added. While output value decreased, value added increased. This indicates that intermediate inputs costs decrease was stronger than output value decrease. The sector is also able to employ some of the labour disengaged from the agriculture-food sector but at a reduced wage rate.

The improvement in value added is sustained in the long run so that its returns to capital and labour employment are both higher through out the period. The consistently higher returns to capital attracts more investment by destination to the sector through out the period.

Manufacturing-Intermediate Goods

Here tariffs are reduced by 40%. This increases import competition as in the agriculture food sector. In the short run, output volume increases and prices decrease at a

faster rate so output value decreases. Value added also decreases. The drop in prices induces a very small increase in domestic demand and a much larger increase in export demand resulting in the observed output volume increase. At the same time, imports demand volume increases faster than the 2. In order to increase output volume, labour employment increases slightly but at a reduced wage rate so that the wage bill does not increase. The loss of revenue leads to a reduction in returns to capital.

In the long run, output value and value added remain lower compared to the base run. However the decline in value becomes weaker over the years. Output volume is lower as less capital is employed due to a temporal fall in returns to capital in the early part of the period. This fall was caused by the loss in revenue. More labour is employed but as the sector is capital intensive the loss in capital stock has a stronger effect. As can be expected its share of investment decreased when returns reduced in the early years but increased afterwards. The improvement in prices (i.e. being less negative) in the long run indicates that output was supply constrained. This improvement also led to a relative improvement in revenue and the associated returns to capital compared to the agriculture sectors. We observe that the negative sales effect of the reduction of tariffs becomes weaker over time as investment and labour supply increase. Evidently, these are reallocated from sectors that are not improving as fast as it is.

Service Sector

Tariffs are unchanged in this sector. In the short run, output volume increases and prices decrease at a faster rate so that output value decreases. Value added decreases as well. The deflationary environment leads to a reduction in prices. Domestic demand volume increases slightly while a larger increase occurs in export demand. Labour employment increases in order to increase output but at a lower wage rate. The decrease in sales is followed by a decrease in returns to capital.

In the long run, output value and value added remain lower than in the base year as prices remain lower. The loss in sales revenue is therefore persistent. Output volume is higher compared to base run but the change in prices is strongly negative. Though it employs less capital than in the base year, output volume is higher because of an increase in labour employment given the labour intensive nature of the sector. With the consistent reduction in sales and returns to capital, investment is reallocated better performing sectors like the Manufacturing-capital, intermediate goods and the oil sector. Both export and domestic demand volumes increase due to lower prices. 83% of gross output in this sector is intermediate inputs therefore the deflationary environment has a strong effect on its prices.

SUMMARY

It is clear that in the long run, investments are reallocated from the agriculture and service sectors to the manufacturing and oil sectors where rates of return increase. In the short run, the 2 sectors with the highest increases in tariffs (oil and manufacturing-capital) experience increase in nominal value added and returns to capital. In both the short and long run the agriculture-food sector loses labour to the other sectors-mainly the manufacturing sectors.

The short run winners from the ECOWAS trade liberalisation scheme remain the long run winners- Manufacturing-capital and oil sector as the short run increase in their value added is sustained in the long run. These 2 sectors have relatively high rates of return in the base year and are further boosted by the increase in tariffs. Though the decrease in value added is sustained in the long run for all the other sectors, the manufacturing consumer and manufacturing-intermediate goods experience lower negative effects in the long run due to relatively improved prices in the long run. This indicates that output was supply constrained during the period.

ECONOMY WIDE EFFECTS

In the short run, the change of aggregate demand composition in favour cheaper imports decreases nominal gdp by 2%. However the fall in the producer price index by 2.207% leads to an increase of real GDP by .04%. This is similar to the findings of Olofin et al (2001). The fall in nominal income reduces the overall income to land, labour and capital by 3%, 3% and 1% respectively. This is as a result of the land and labour intensive sectors being those whose value added contracted the most as a result of the TL scheme. The agriculture sectors which experienced the highest reduction in sales and employ over 60% of the labour force are important in this respect.

The fall in weighted average tariffs leads to a fall in the consumer price index of 2.7%. The nominal wage rate and average returns to land and capital fall by the same rate their total returns did. Nominal consumption falls but as the CPI falls faster real consumption increases. Both nominal and real investment falls. The decrease in nominal GDP leads to a fall in nominal investment which is stronger than the fall in the investment price index. Real investment falls as a result.

Government revenue decreases by 3% due to the decrease in tariffs and nominal GDP. In a general equilibrium setting it is clear that the effect on government revenue depends directly on the degree of reduction in tariffs and indirectly on the degree of change in the nominal GDP. However, for Nigeria which obtains much of its government income from oil profit tax and royalties the latter is made less important. In this case the depressionary environment actually boosts oil exports as the local price of exports reduces. Total exports increase by the same amount as total imports as the current account balance is fixed. This implies that cheaper imports can only be consumed more to the extent that foreign exchange inflows from exports permit.

In the long run, the decrease in domestic demand in favour of imports is maintained and nominal gdp is lower than in the base year implying persistent loss in sales revenue. The fall in nominal GDP is higher than the fall in the producer price index so real GDP falls

slightly unlike in the short run where it increased. Generally the influx of cheaper imports depresses prices for most sectors for most of the period. Over time the average returns to capital quickly improves as investment is reallocated to expanding sectors so that in the long run the average returns to capital increases by 1.6% compared to base year.

The returns to labour decreases by 3.9% which is stronger than the short run decrease. With the expanding sectors being capital intensive it is logical that the average returns to capital improve while labour income reduces. The average returns to land also reduces by a greater percentage than in the short run for the same reason. It is clear that the manufacturing-capital, the oil sector and capital benefit from the ECOWAS Trade liberalization scheme while land, labour and the agriculture sectors lose from it the most. The long run impacts in terms of value added are that the only 2 sectors that gain are the oil and manufacturing capital sectors .These sectors' value added increase through out the period- all other sectors experience different degrees lower value added throughout the period.

POVERTY AND INCOME DISTRIBUTION

Initial factor endowments are such that urban households receive 40% of labour income and depend on it for 24% of their income. They receive 35% of land income and depend on it for 13% of their income. Capital income is 63% of their income and they receive over 90% of distributed capital income. Rural households earn 60% of labour income, mostly from the agriculture sectors, and earn 57% of their income from through this factor. They earn 65% of land income and obtain 37% of their income from this factor. Their share of capital income is less than 10% and they earn a small fraction of their income from this factor.

In the short run, the fall in capital income is less than the fall in both labour and land income due to the stronger negative effects in labour and land intensive sectors. As a result nominal rural household income falls faster than urban household income. The fall

in the later is less than the fall in the consumer price index so real urban household income increases while real rural income decreases[14].

While the average returns to capital improve in the long run, the returns to both labour and land detoriate. In the long run, the nominal incomes of both households further reduce compared to the base values. Though returns to capital improve, the urban household's income from labour and land also decrease and causes its income to reduce compared to the base year. While the fall in urban income is not strong enough to reduce real income, the fall in rural income is stronger and this causes real rural income to reduce in the long run. We therefore observe that the negative effects on land and labour intensive sectors in the long run translates into lower real incomes for rural households. For urban households the continuous decline in nominal GDP causes the growth of real income to decline in the long run.

In the base year 66% of the population is poor- 58% in urban areas and 70% in rural areas- with a gini coefficient of 46.88%. In the short run the TL scheme results in a slight increase in the national poverty rate by .08%. In the long run the effect is stronger as poverty increases by 1.38%.

These effects are not the same for urban and rural households and highlights the need for analyzing the effects separately. The SR increase in national poverty level in spite of a SR growth in real GDP indicates that growth was not evenly distributed amongst households. This reflects the new thinking concerning growth - *equitable* growth is what is needed for poverty reduction. In the short run though national poverty level rises, urban households' poverty decreases by .5%.In the long run the effect is similar as their poverty levels decrease by .51% in line with changes in real income. In both the short run and long run the equivalent variation for urban households is positive.

[14] With regional CPIs the effects are still the same due to the strong fall in nominal rural income.

Rural households on the other hand experience an increase in their poverty rate by .34% and 2.45% in the short and long run respectively. Clearly the contraction of labour and land intensive sectors reduces the incomes earned by rural households to a greater extent in the long run. In both the short run and long run the equivalent variation for rural households is negative. Income distribution worsens as the gini coefficient increases by .15% and .13% in the short and long run respectively.

5. CONCLUSION

The adoption of the ECOWAS Tariff rates brings about mixed results especially as it causes increases in tariffs in some sectors and decreases in others. Two sectors which traditionally have relatively high returns to capital emerge as winners in the scheme- the oil and manufacturing-capital. This is due to 3 factors: they initially have relatively high returns to capital, the TLS increases the tariff on their products and decreases import competition and the lower prices due to lower average tariffs promotes the exports of these sectors. Over all, both their value added increases in both the short and long run. In the long run investments are reallocated chiefly to these 2 sectors as their value added expands and this further spurs output. The other sectors all experience decreases in value added in both the short and long run. As the winners from the scheme are capital intensive, capital income improves over time while land and labour income reduce. This has positive implications for urban households and negative for rural households due to the dependence of the later on mostly land and labour income. As a result, urban poverty decreases in the short and long run while rural poverty increases in both periods.

It is clear that the impact on the agriculture sectors has the most important implications for poverty. For the ECOWAS tariffs to have positive effects on poverty, policies which will make the sectors' products more competitive (both quality and price wise) have to be successfully implemented alongside or before ECOWAS tariffs adoption. On the supply side, policies which can attract more investment into the sector over time will be useful. A

reform of the land tenure system which has hitherto discouraged large scale commercial and more capital intensive farming would be productive in this regard. To the extent that large scale farming can create economies of scale and reduce unit costs it would be very useful[15]. While manufacturing firms face possible loss of revenue and value added they are not as 'poverty-vulnerable' as the agriculture sectors because they are more capital intensive and their import tariffs are not reduced as much.

[15] A host of issues not mentioned above are important in choosing a strategy to make the agriculture sectors more competitive (price and quality wise). The government and farmers would have to fashion strategies that produce the optimal net effect as a strategy can have problematic effects - e.g. increasing capital at the expense of labour can increase unemployment in the sector.

[6]. REFERENCES

Agenor and Fofack (2003) "IMMPA: A quantitative macroeconomic framework for the analysis of poverty reduction strategies" .The World Bank.

Aigbokan, Ben (1998) The Impact of Adjustment Policies on Income Distribution in Nigeria: An Empirical Study. Research Report No 5.DPC

Ajakaiye and Adeyeye (2001). The nature of Poverty in Nigeria. NISER Monograph Series No 13.

Akinyosoye et al, Akande, Akpokodje and Mbanefoh (1998) Trade and Exchange rate liberalisation and competitiveness of Nigeria's Tradeable commodities. NISER

Annabi et al (2004) A Dynamic Sequential CGE Model for Poverty Analysis. Mimeo, University of Laval.

Annabi et al (2005) Implications of WTO Agreements and Domestic Trade Policy reforms for Poverty in Bangladesh: Short vs long run.

Central Bank of Nigeria (2003a) Annual Report and Statement of Accounts

Central Bank of Nigeria (2003b) Statistical Bulletin Vol 12.

Dervis, K., J. de Melo, and S. Robinson (1982) General Equilibrium Models for Development Policy. Cambridge University Press.

DFID (2000) Nigeria: Country Strategy Paper

Dissou, Yazid (1998) Dynamic Effects in Senegal of the Regional Trade Agreement Among Eumoa Countries CREFA

Dorosh, P. (1996) Implications of Macroeconomic policy for the poor in Nigeria: A general equilibrium analysis

Duclos, J-Y, Araar, A. and Fortin, C. (2004), DAD: A Software for Distributive Analysis/ Analyse Distributive. CIRPEE, Université Laval and PEP Network. http://www.pep-net.org

Federal Ministry of Commerce (2001) Trade Policy of Nigeria.

Federal Office of Statistics (1996) Input-Output Tables of the Nigerian economy 1985, 1987 and 1990.

Federal Office of Statistics (1999) Poverty Profile of Nigeria (1980 – 1996)

Federal Office of Statistics (2001) Annual Abstract of Statistics

Federal Office of statistics (2004) The Nigerian Statistical Fact sheets on economic and social development

Federal Republic of Nigeria (1999) National Accounts of Nigeria 1981- 1998.

IMF (2005) Nigeria: Selected Issues and Statistical Appendix

Kuji LTD (2002), Comprehensive Review of the Nigerian Customs and Excise Tariff 1995 – 2001: Implications for Nigeria of The ECOWAS Common External Tariff and Nigeria's Obligations/commitments under WTO, ECOWAS, AGOA AND ACP-EU.

Löfgren et al (1999), Trade Liberalization and Complementary Domestic Policies: A Rural-Urban. General Equilibrium Analysis of Morocco TMD DISCUSSION PAPER NO. 41 IFPRI

Lofgren et al (2001) Poverty and Inequality Analysis in a General Equilibrium Framework: The Representative Household Approach

Nwafor (2005) Trade Liberalisation and poverty in Nigeria: lessons from the past. (Forthcoming)

Ogundele (2001) Effect of Trade liberalisation on Nigeria's Fish and shrimps exports. NISER monograph series no 6, 2001. NISER

Okunmadewa ,F., Olomola and Adubi ,B. (1999) Trade Liberalisation and Food Security: Situation Analysis in Nigeria . Research Report No 17 DPC

Olofin et al (2001) A Computable General Equilibrium Model of Nigeria's Trade Competitiveness. CEAR Research Paper No 2001/01 CEAR , Ibadan.

Oyejide, T.A. (1986). The Effects of Trade and Exchange Rate Policies on Agriculture in Nigeria" International Food Policy Research Institute, Research Report 55.

Oyejide, T.A. (2001) "Nigerian Trade Policy in the Context of Regional and Multilateral Trade Agreements.Research Report 27.DPC Ibadan.

Soludo and oji (2003) "Does Trade Openness make sence at this time in Nigeria? A Prepared for the Trade and macroeconomic Working Group, TRADEMAC.

UNDP (1995) "Perspective Planning For Nigeria: Draft Final Report on The Construction Of A Social Accounting Matrix For Nigeria"

Waziri A.D (2003) Opening address by Ambassador Waziri, Honourable Minister of Commerce, at the one-day Stakeholders forum on Trade and Macroeconomic Reforms. Organized by African Institute for Applied Economics at Nicon Hilton Hotel

World Bank (1996) Nigeria: The Challenge of Growth with inclusion