Economics of Tropical Deforestation In Nigeria

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Abstract: The trend of deforestation in Nigeria and its attendant consequences has led to the need for a pragmatic solution to the alarming rate of deforestation. This paper, thus, explored a macroeconomic analysis of tropical deforestation in Nigeria. Specifically, the paper described the trend of forest stock and selected forest products in Nigeria in the last three decades, and the effect of selected macroeconomic variables on forest stock in Nigeria. The data for the study were secondary data collected for the period of 1970-2003. Sources of data include Food and Agriculture Organization (FAO), annual reports and statement of accounts and statistical bulletin of the Central Bank of Nigeria, Federal Office of Statistics and Federal Forestry Department. The key data collected include annual forest stock, forest products, population and macroeconomic variables such as export value, export price, exchange rate, interest rate and per capita income such as export value, export price, exchange rate, interest rate and per capita income among others. The study utilized analytical tools such as the frequency distribution and error correction modeling, which employs co-integration technique. Results revealed that there was a general increase in output of saw-log and wood charcoal during 1970-2003 period which portends continuous exploitation of forest stock in Nigeria. Result also shows that variables became stationary at levels, first difference and at second difference. The Johansen co-integration test reveals that the null hypothesis of no co-integration was rejected at 5 percent significance level. The likelihood ratio test was greater than the critical value up to the fifth value of 48.65; thus, the likelihood ratio test indicates the existence of 5 co-integrating equations. The result of the Error Correction Model shows that all the variables except value of forest stock exported carried the expected signs. Finally results also show that macroeconomic policies such as fiscal policy such as increase in government expenditure in agriculture significantly, impact positively on forest stock in Nigeria. Also monetary (high interest rate) and exchange rate policies impact negatively on forest stock product in Nigeria. Population and export price of sawn wood also impact negatively on forest stock in Nigeria.
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Introduction

The importance of monitoring the state of forest is reflected in current tropical forest resources assessment. Environmental concerns are focusing increasingly on tropical timber production, both in consumer and producer countries. Various type of trade-related actions are suggested in order to halt the process of deforestation. Such trade related actions includes; consumer boycott of tropical timber, limiting purchases to wood derived from forest stock and differential tariff surcharges to finance assistance to tropical forest management. Some of these suggestions are based on the rationale that reduction of international trade in tropical wood product should reduce the incentive to cut down tropical forest; while other advocates consider trade levies as a mean of raising funds for improved forest management, international trade action advocates that both consumer and produce countries belonging to the international trade action advocates that both consumer and producer countries belonging to the International Tropical Timber Organization (ITTCO) should pledge their commitment to sustainable tropical timber management such as sawn wood log and panel (FAO 1999). The likelihood of successfully reducing deforestation with trade restriction is doubtful, however, since only six percent of wood harvested in the developing countries enter international trade while the bulk of tropical wood product is used domestically. Furthermore, the harvesting of timber either for fuel wood or commercial wood uses is only one cause of tropical deforestation, the clearing of land for agricultural settlement is recognized as having significant impact (Khan 1992).

There are three main types of forest: Tropical forest, Temperate and Man-made plantation (FAO 1997). Tropical forest consists of tropical moist and tropical dry forest. Tropical moist can be sub-divided into tropical rain forest and tropical deciduous forest. The tropical rain forest accounts for two third of tropical moist forest. It is also very valuable tropical hardwood. The tropical deciduous forest, which lies along the fringes of tropical rainforest, is less

complex than the rainforest. Tropical moist forest can be classified according to management criteria as primary forest, secondary forest and forest fallows (FAO 1999). Forest all over the world provides a renewable source of raw material, energy and services for nations and communities with their supply of timber, fuelwood, game and a rich variety of other products (FAO 1999). Forest is valuable environmental and economic resources which supports natural system and play an important role in economic welfare of human societies. They maintain the dynamic condition necessary for their continued existence and support the ecosystem within the natural system (FAO 1999). Presently, the rate of exploitation of forest resources in many developing countries is approaching a critical level and this is due to the fact that a large proportion of the population is rural which depends heavily on forest products for survival.

Commercial activities such as logging mining and hydroelectric projects account for decline in forest resources. Commercial logging in Nigeria has been more widespread and intensive than other developed economy while poor harvesting techniques have led to severe ecological degradation. Deforestation in Nigeria is not due to the pursuit of economic development alone, but also as a result of lack of sound environmental policies which are suppose to address poorly defined property right and under pricing of forest products. Deforestation is also attributed to poor soil productivity, the farmer, forest communities and government illegally encroaching upon forest estates in search of fertile land for crop production (FMEN 2001).

FAO (1999) observed that Africa forest resources account for nearly 23 percent of world's total forest resources. Its per capita forest area (0.7 hectares) when compared with other continents in the world is higher than that of Asia, (0.11 hectares) but lower to that of Europe (1.3 hectares) north central and south America with per capita figures averaging 3.7 hectares. Sub-Saharan Africa exhibits annual population growth rate, large rural population, accelerating urbanization and low per capita income. These factors combine with others to exert destructive pressure on forest to supply fuel wood, poles and food at unsustainable rate. It is estimated that 70 – 90 percent of total energy consumption is derived from wood and thus dependence on the forest is likely to increase as a result of income and poverty situation of people in Africa (FAO 1999).

FAO (1995) stated that the annual tropical forest loss worldwide as 15.4 million hectare, a staggering 42,000 hectare per day. Africa is losing 4.1 million hectare annually than several European countries. Tropical forest has almost disappeared in the Republic of Benin, Cote d' voire Ghana, Nigeria and Togo. (FAO 1996). Forest cover in Nigeria has been converted to secondary re-growth vegetation, mainly as a result of shifting cultivation and lumbering . Nigeria tropical forest is fast depleting because of human influence, logging and government activities such as road construction, arable cropping and land clearing for pasture (FMEN, 2000).

FAO (2000) asserted that thee are about 2.430km^2 of forest land to 1000 Nigerians, based on the country population of 115 million with forest area of 279, 010km^2 and that the total area of protected forest stands at 13,031km^2. Deforestation can be associated with development and scarcity of infrastructure, debt, and lack of investment in human capital base, economic expansion and human inequality of access to land. Besides poverty, urbanization and population growth, inadequate knowledge and information about ecology and powerful interest groups in forestry for agricultural purposes are the driving forces of deforestation in Nigeria. FAO (1996) estimated Nigeria's forest resources as 5 percent of the total land area on the basis of forest reserves. This is small and inadequate to meet the demand of the rapidly growing population. Existing forest reserves are being rapidly depleted at the rate of 288,000 hectare per annum (FAO 1999). In 1996, forest reserves occupies 72,000km^2 out of the total 924,000km^2 land area in Nigeria. The country annual deforestation rate was 14.3 percent of the total forest area (FMWEN 2000).

From the foregoing, forest is often perceived as stock resources, free good with land freely available for conversion to other uses, hence the reason for the high rate of deforestation without recognition of the consequences of its economic and environmental role. The challenges to government and other stakeholders in environmental research are to counteract the negative consequences of high rate of deforestation in Nigeria. providing a sound macroeconomic framework strategy or policy which could counteract the high rate of deforestation in Nigeria. This explains why this study is interested in assessing the economics of deforestation in Nigeria using macroeconomic variables as likely key determinants of deforestation. The assessment of factors driving deforestation in Nigeria will however lead to several researchable questions such as: What trend of production does forest stock follow in the last three decades? and what extent does macroeconomic variables impact on forest stock in Nigeria? Answers to these questions will go a long way in supplying answers to factors that promotes or retard deforestation in Nigeria.

Cleaver and Schreber (1994) suggested that deforestation is related positively to population

pressure on cultivated area, (the less the cultivated area per person, the greater the rate of deforestation). The higher the rate of population growth, the higher the rate of deforestation due to land clearing and fuel gathering. Also the more profitable agriculture activities are, the more rapid the clearing of forest. Deforestation was hypothesized to be positively related to drought and negatively related to the use of modern inputs such as fertilizer. (The greater the use of such inputs, the lower the need to clear more forestland for farming). Open access land tenure situation are also hypothesized to stimulate deforestation.

Co-integration and Error Correction Modeling (ECM)

In the estimation is integrated of order d writing I (d) if it must be differenced d times to be made stationary. Thus a stationary variable is integrated of order zero, written I(0). A variable which must be differenced once to become stationary is said to be I(I), integrated of order 1. Most times, economic variables are not integrated of order The statistical tests to determine whether each of the economic variables is *I(0)* or *I(1)* are:

1. The Dickey Fuller (DF)
2. The Augmented Dickey Fuller (ADF). The DF test (Fuller 1976), Dickey and Fuller (1979), is carried out by applying a regression such as:

$$X_t = C_t + \lambda X_{t-1} + e_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

The t-value is then compared with Fuller 1976 distribution table. In the ADF test a regression such as:

$$\Delta X_t = C_t + \lambda X_{t-1} + \sum_{i=1}^{n} b_i \Delta X_{t-1} + e_t \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

is run and the t-test is carried out.

Tests for co-integration are based on looking for unit roots in residuals rather than in raw data and hence the DF and ADF unit root test are limiting and therefore require special critical value. This special value is tabulated by Engle and Granger (1987) DF and ADF. Several empirical studies have use co-integration methodology they include Hallam et al (1994) Handry (1986), Mohanty et al (1996), Sarker (1993) and Tambi (1999). Johansen (1988) and Johansen and Juselius (1991) present a co-integration methodology that overcomes most of the problems of the two-step approach. The procedure is based on maximum likelihood estimates of the co-integration vectors in a given set of variables and provides two likelihood ratio tests for the number of co-integrating vectors.

In Nigeria Tijani et al (1998) employed co-integration and error correction model to estimate export supply function. The results indicates that weather effect is stationary while producer price and hectare planted to cocoa have long run equilibrium relations with cocoa export. Yusuf (2000) in a study of the effects of liberalized trade and exchange rate policies on agriculture in Nigeria showed that the co-integration test reveals a long run relationship between the dependent variables and their independent variables. Coe and Mogladam (1993) estimated an aggregate production function using Johansen and Juselius method. The empirical results suggest that the growth of output in France has been spurred by increased trade integration within the European community and by the accumulation of capital from the business sector, government infrastructure, residential and research and development.

This study is another effort in the application of co-integration methodology to study time trend data in another important aspect of the Nigeria economy -forestry. The study follows the outlined procedures as in past studies; a deviation is in the application of the Johansen methodology for the co-integration test.

The general model is given as:

$$X_t = C_1 + \lambda_1 X_{t-1} + \ldots + \beta_1 X_{t-1} + e_t \ldots\ldots\ldots\ldots\ldots\ldots (3)$$

t = 1…n.

The first different form is given by:

$$\Delta X_t = C_t + \lambda_{k-1} X_{t-k-1} + \beta_t X_{t-k} + e_t \ldots\ldots\ldots\ldots 4)$$

Materials and Methods

Nigeria is a country of marked ecological diversity and climate. The lowest point is the Atlantic Ocean at sea level while the highest point is the chappal at 2,419m (Ibitoye 2006). Nigeria has diverse biophysical characteristics, ethnic nationalities, agro-ecological zones and socio-economic conditions. The Federal republic of Nigeria is in West Africa between latitudes 4o to 14o North and between longitude 2o21 and 14o301 East. According to Federal Ministry of Environment in Nigeria (FMEN 2001) estimated irrigated land, 13 9,570km^2.

The data for this study were main secondary data collected for period between 1970 – 2003. Sources of the data include Food and agriculture Organization (FAO), annual reports statement of accounts and statistical bulletin of the Central Bank of Nigeria, Federal Office of Statistics and Federal Forestry Department. Information sought from these various publications include annual forest stock, forest products, population and macroeconomic

variables such as export value, export price, exchange rate, interest rate and per capita income among others.

The study utilized both the descriptive statistics as well as analytical tools such as the Error Correction Model which employs co-integration technique. The descriptive analysis employs percentage, means and tables among others to describe the trend of forest stock. The Error Correction Model was used to determine the effect of population, per capita income and other macroeconomic variables on forest stock. Each of the variables is first tested to establish whether they are stationary or not with the appropriate unit root test. They are thereafter co-integrated to determine whether a linear combination of the variables would be stationary even though individual variable may be non-stationary.

Unit Root Test: The statistical tests to determine whether each of the economic variables is stationary or non-stationary are:

1. The Dickey Fuller (DF)
2. The Augmented Dickey Fuller (ADF). The DF test (Fuller 1976), Dickey and Fuller (1979), is carried out by applying a regression such as:

$$X_t = C_t + \lambda X_{t-1} + e_t \quad \text{.....(7)}$$

The t-value is then compared with Fuller 1976 distribution table. In the ADF test a regression such as:

$$\Delta X_t = C_t + \lambda X_{t-1} + \sum_{i=1}^{n} b_i \Delta X_{t-1} + e_t \quad \text{.....(8)}$$

is run and the t-test is carried out.

The co-integration test employs the Johansen approach. The general model is given as:

$$X_t = C_1 + \lambda_1 X_{t-1} + \ldots + \beta_1 X_{t-1} + e_t \quad \text{.....(9)}$$

t = 1…n.

The first difference form is given by:

$$\Delta X_t = C_t + \lambda_{k-1} X_{t-k-1} + \beta_t X_{t-k} + e_t \quad \text{.....(10)}$$

Where:

X_t =Vector of n variables

$\exists_t$ =Coefficient of the variables.

e_t = Error term.

The implicit form of the model investigated in the study is given by.

$$FSTOCK = f(GEXP_{t-a}, IRATE_{t-b}, PCI_{t-c}, POP_{t-d}, PRICE_{t-e}, EXPT_{t-f}, BLOAN_{t-g}, XATE_{t-h}, PPP_{t-i}) \quad \text{..(11)}$$

Where:

$FSTOCK$ = Forest Stock(metric ton)

$GEXP_{t-a}$ = Government Expenditure (Naira)

$IRATE_{t-b}$ =Average interest Rate charged by financial institution (percentage)

PCI_{t-c} = Per Capita Income(Naira)

POP_{t-d} = Population(Number)

$PRICE_{t-e}$= Export price of sawn-wood (proxy for forest stock) in Naira

$EXPT_{t-f}$ = Value of Export(Naira)

$BLOAN_{t-g}$ = Volume of loan to the agricultural sector.

$XRATE_{t-h}$ = Exchange rate. (Naira)

PPP_{t-i} = Petroleum Product Price (kerosene) (Naira)

$a…i$ are values to which each of the variables was lagged.

A priori expectation: Three variables are expected to carry a positive sign, these are: per capita income, government expenditure and volume of loan from commercial bank. Thus, an increase in these variables would increase forest stock. The remaining six variables are expected to carry a negative sign, meaning that an increase in the variables would decrease forest stock.

Result

The results of the analysis are summarized in 5 tables as follow: Table 1- Trend of selected forest products (in metric Tonne), Table 2- Result of Unit Root Test, Table 3- Result of Johansen Co-integration Test, Table 4:- Result of the Error Correction model for the determinants of forest stock and Table 5- Reduced Form Result for the Determinants of forest Stock

Table 1: Trend of selected forest products (in metric Tonne)

period (years)	Saw-Log	Industrial Round-Wood	Wood charcoal	Sawn-wood	Plywood
1970-1975	1555600	1866000	1076741	730400	54620
1976-1980	3399200	2102400	1262832	1674000	72800
1981-1985	5549400	2279000	1638467	2752600	85600
1986-1990	5668000	2279000	2015100	2885800	69400
1991-1995	5894000	2279000	2427162	2606800	66000
1996-2000	686000	2279000	2930052	2035600	55600
2001-2003	7100000	2279000	3207192	2000000	55000
AVERAGE	5159457	2194771	2079649	2097885	65574

Table 2: Result of Unit Root Test

Variable	Critical values at levels 1% = -3.6752 5% = -2.9665 10% = -2.6220	Critical values at First Difference 1% = -3.6852 5% = -2.9705 10% = -2.6242	Critical values at Second difference 1% = -3.6959 5% = -2.9750 10% = -2.6265
Value of export (forest stock) (EXPT)	-1.7529	-4.5998	-4.9557
Exchange rate (EXRATE)	-1.1658	-3.1694	-5.97.10
Forest stock (FSTOCK)	-2.1747	-3.1835	-5.9509
government Expenditure (GEXPD)	-2.6079	-3.6858	-8.9081
Interest rate (INTRATE)	-0.3621	-5.0883	-10.6274
Per capita Income (PCI)	1.0665	0.9484	1.9507
Population (POP)	0.2366	-1.7578	-8.1460
Export Price of Sawnwood (PRICE)	-3.2284	-5.1101	-6.7079
Volume of Loan to the agricultural sector (BLOAN)	5.6135	3.4761	-1.7577
Petroleum Product Price (Kerosene) (PPP)	3.5424	-1.8821	-5.3292

Table 3: Result of Johansen Co-integration Test

Likelihood ratio	Critical value at 5%	Critical value at 1%	Hypothesized number of co-integrating equations
337.20	156.00	168.36	None**
226.15	124.24	133.57	At most 1**
135.00	94.15	103.18	At most 2**
79.19	68.52	76.07	At most 3**
48.65	47.21	54.46	At most 4*
22.60	29.68	35.65	At most 5
6.4	15.41	20.04	At most 6
1.05	3.76	6.65	At most 7

*(**) denotes rejection of hypothesis at 5% (1%) significance level.
LR test indicate 5 cointegrating equation(s) at 5% significance level

Table 4: Result of the Error Correction model for the determinants of forest stock

VARIABLE	COEFFICIENT	STANDARD ERROR	PROBABILITY
C	1421374	875302.9	0.1797
D(FSTOCK (-1),1)	-1.499756	0.384912	0.0176
D(FSTOCK (-1),2)	0.620625	0.243711	0.0635
D(EXPT (-1),1)	8.625478	82.98381	0.9222
D(EXPT (-1),2)	20.55206	3475238	0.5861
D(EXRATE)	5045.557	14734.64	0.7493
D(EXRATE (-1),1	-49864.90	102417.5	0.6518
D(EXRATE(-1),2)	63155.12	118119.2	0.6212
D(GEXPD)	89.17147	69.68056	0.2698
D(GEXPD(-1),1)	236.3401	261.1371	0.4166
D(GEXPD(-1),2)	-105.1761	200.3445	0.6274
D(INTRATE)	-35787.53	30851.35	0.3106
D(INTRATE (-1),1)	-70621.09	76848.56	0.4101
D(INTRATE (-1),2)	16858.70	46645.11	07361

D(POP)	-7625.032	2486.026	0.0374**
D(POP(-1),1)	6945.008	2506.903	0.0503**
D(POP(1-1)2	10050.35	2147.017	0.0094***
D(PPP)	-53270.61	224104.2	0.8238
D(PPP(-1),1)	81157.71	537883.5	0.8874
D(PPP(-1),2)	-53386.44	269787.0	0.8528
D(PRICE)	-58523.46	22470.00	0.0598*
D(PRICE(-1)1)	-74464.16	52526.69	0.2293
D(PRICE(-1),2)	24278.10	37990.35	0.5575
ECM	1.011551	0.249633	0.0154**

R^2 = 0.936955, D.W = 2.091235, F- Statistics = 2.584620

*** Significant at 1 percent, ** significant at 5 percent, * significant at 10 percent

Table 5. Reduced Form Result for the Determinants of forest Stock

VARIABLE	**Co-efficient**	**Standard Error**	**Probability**
C	1348486	279739.3	0.0005
D(FSTOCK (-1),1)	-1.410467	0.254726	0.002
D(FSTOCK (-1),2)	0.571049	0.138711	0.0017
D(EXPT (-1),2)	32.51753	7.721733	0.0015***
D(EXRATE (-1),1	-70874.78	23394.32	0.0115***
D(EXRATE(-1),2)	74462.13	22748.05	0.0074***
D(GEXPD)	110.6206	32.21856	0.0056***
D(GEXPD(-1),1)	315.3136	96.61892	0.0076***
D(GEXPD(-1),2)	-144.1528	66.79756	0.0539**
D(INTRATE)	-32928.84	10818.28	0.0112***
D(INTRATE (-1),1)	-45171.68	12678.02	0.0044***
D(POP)	-6726.587	1805.068	0.0033***
D(POP(-1),1)	6085.664	1754.699	0.0053***
D(POP(1-1)2	9204.385	1546.647	0.0001***
D(PRICE)	-56524.54	15844.09	0.0044***
D(PRICE(-1)1)	-44904.79	19806.71	0.045***
ECM	0.954356	6.070458	0.0001***

R^2 = 0.894130, D.W = 2.418532, F-statistics = 5.806301

Discussion

Result in table 1 shows that the output of forest products such as sawn-log and wood charcoal increased throughout the period under study from an estimated 1, 555,100 and 1,076, 74 metric tonnes in the 70-75 period to 5,668,000 and 20,5100 metric tones the 86-90 period respectively. The increase continued in the 2001-2003 with an estimated value of 7,100,000 and 3,207, 192 metric tonne. Industrial round-would however increased only form 1,866,000 metric tonne in the 70-75 to 2,279,000 metric tonne in the 81-85 period, output was constant at this value for the rest of the period. Output of swan wood and plywood did not follow a particular trend. Sawn-wood increased from 730,400 metric tonne in the 70-75 period to 2,885,800 metric tonne in the 86-90 period. The value however decreased consistently from this value to 2,000,000 metric tonne in the 2001-2003 period. Plywood increased from 54,620 to 85,600 metric tonne in the 70-75 and 81-85 respectively before it decreased consistently to 55,000 metric tonne in the 2001-203 period. The general increase in the output of most of the forest products portends a continuous exploitation of forest stock as a result, there is a decreased forest stock since replacement are not encouraged in Nigeria.

Effect of Selected Macroeconomic variables on forest stock

Table 2 shows the result of the unit root tests. The result shows the levels at which variables are stationary. From the result in table 2, variables were differenced up to second level. This is because the second level had more variables that were stationary. Eight of the variables were stationary at the second level. It was only per capita income and volume of bank loan that were not stationary at the second level. These two variables were therefore jettisoned from the co-integration test while the stationary variables were used in the co-integration test. (Charris 1995 and Granger 1987). Having established the stationarity of the eight variables, they were co-integrated to determine whether in the long run, the variables converge to equilibrium.

Johansen Co-integration Test:

Results in table 3 shows the outcome of Johansen test. It reveals the null hypothesis of no co-integration was rejected at 5 percent significant level. The likelihood ratio test was greater than the critical value up to the fifth value of 48.64. Thus, the likelihood ratio test indicates the existence of 5-co-integrating equations. The existence of co-integration led to the estimation of long-run solution under the error correction framework.

Effects of macroeconomic variables on forest stock

The result of the Error Correction Model is presented in table 4. All the variables except value of forest sock exported, carried expected signs. An increase in government expenditure on agriculture for instance will likely increase forest stock. As a result, the variables carried a positive sign. Price of petroleum product (kerosene), Population, export price of sawn wood and interest rate carried negative signs. This can be interpreted as an increase in any of these five variables will lead to decrease in forest stock. Significant variables include population (at 5 percent), lagged values of population (at 5 and 1 percent) and export price of forest product at 1 percent. The coefficient of multiple determination R^2 was estimated at 93.69 percent meaning that more than 90 percent of variations in the dependent variable was explained by the independent variables. The Goodness –of- Fit, F-statistics of the model is 2.58 and it is significant at 5 percent. The error correction factor, which explains, the feedback mechanism was also significant at 5 percent.

The reduced form of the Error Correction Model is presented in table 5. The result shows that lagged export value, lagged exchange rate, government expenditure, interest rate, population and export price of sawn wood significantly influence volume of forest stock at 1 percent level of significance. Lagged value of export price of sawn wood and the value of government expenditure lagged by two years significantly impact on forest stock in Nigeria at 5 percent level. The coefficient of government expenditure on agriculture carried expected positive sign. This implies that fiscal policy characterized by expansion in government budget on agriculture could bring about significant increase in forest stock in Nigeria, it should however be noted that the value of export of forest product did not carry the expected sign. Result also revealed that increase in interest rate charged by financial institutions in Nigeria impact negatively on forest stock. This is due to the monetary policy that is characterized by high interest rate will likely discourage investment in forest stock business as returns to forest stock is not immediate unlike returns to annual corps. Population also impact negatively on forest stock going by the result in table 5 which suggests that the higher the population the lower the forest stock in Nigeria. This may lead to the need to clear new forest areas for settling increasing population and production of food crops to meet the food demand of increasing population. The result in table 5 also revealed that the higher the exchange rate the lower the forest stock available in Nigeria. This may be attributed to the fact that highly depreciating Naira (Nigeria's currency) will encourage illegal felling of forest resources that can be exported to earn scarce and highly valuable foreign currencies. Therefore, be it can be deduced from this result that a foreign exchange policy that is characterized by sustained decline in Naira value of Nigeria will encourage export of forest stock and thereby reduce forest stock since little or no provisions is made for replanting of the forest product. The export price of sawn wood also impact negatively on forest stock in Nigeria. This is expected since a high price of sawn wood will encourage deforestation practices in Nigeria. This is so since the forest product will command high price locally and also allow exporters of sawn wood products have access to scarce and highly valuable foreign currencies. Finally the result has shown that macroeconomic policies such as fiscal policy (government expenditure) monetary policy (interest rate), exchange rate policy, export price of sawn wood and population impact significantly on forest stock in Nigeria. From the findings, this paper has clearly shown that there was a general increase in output of saw-log and wood charcoal products during the 1970-2003 period. This portends a continuous exploitation of forest stock in Nigeria. Also, fiscal policy characterized by increase in government expenditure on agriculture will increase forest stock output in Nigeria. Similarly, monetary policy characterized by high interest rate charged by financial institutions and export price of sawn wood as well as Foreign exchange policy that allows for a highly depreciated Naira will reduce forest stock output in Nigeria. Finally, the key macroeconomic variables that impact on forest stock positively are government expenditure on agriculture, interest rate, and exchange rate.

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