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Agricultural Distortions Working Paper 37, December 2007

This is a product of a research project on Distortions to Agricultural Incentives, under the leadership of Kym Anderson of the World Bank's Development Research Group. The author is grateful for helpful comments from Kym Anderson, John Baffes, Simeon Ehui, Marianne Kurzweil, William Martin and Ernesto Valenzuela, and for funding from World Bank Trust Funds provided by the governments of Ireland, Japan, the Netherlands (BNPP) and the United Kingdom (DfID).

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Distortions to Agricultural Incentives in Nigeria

Peter Walkenhorst

Nigeria is a major player in the developing world. In terms of population, the Federal Republic with its 140 million people is the largest country in Africa and ninth in the world. It is also one of the world's top-10 petroleum exporters and its proven reserves would make it possible to sustain current oil export levels for at least another 25 years. Within sub-Saharan Africa, Nigeria's gross domestic product is second only to South Africa's and is bigger than that of the other 14 members of the Economic Community of West African States (ECOWAS) combined. Nigeria also used to be a formidable agricultural exporter. Up to the mid-1960s, the country's share of world agricultural exports was more than 1 percent. Nigeria had a leading position for several of its export crops, supplying more than half of all traded palm kernel, more than a third of all groundnuts, and more than a fifth of all palmoil. However, agricultural exports collapsed as the economy shifted towards petroleum exploitation, and by the mid-1980s Nigeria's world market share for agricultural products had dwindled to less than 0.1 percent. None of the country's export crops, with the exception of cocoa, commands any significant world market share today (Appendix Figure 1).

The poor performance of Nigerian export agriculture was to a considerable extent the result of changes in incentives that farmers were facing. Public neglect of agricultural infrastructure, erratic changes in agricultural policies, and distortions in the exchange rate regime combined to create an economic environment that hampered agricultural producers, while at the same time burdening consumers with high food prices. More than half of all Nigerians continue to live on less than one US Dollar per day (FOS 2005), and the poverty incidence exceeds 60 percent in rural areas, where people overwhelmingly depend on agricultural activities for their livelihood. Hence, getting agricultural incentives right is of utmost importance not only for fostering economic development and growth, but also to directly fight poverty.

To increase the efficiency of government interventions to foster agricultural development and poverty reduction, policy makers need detailed information on the effectiveness of past

policies. The indicators of policy distortions reported in this study aim to contribute to a better understanding of the direction and magnitude to which policy instruments have affected incentives that agricultural producers and food consumers have faced over the past 50 years. In particular, the distortion indicators attempt to measure the divergence between the price actually paid to the agricultural producer and the price that the farmer would have received in a distortion-free policy environment.

The findings indicate that policies towards agricultural producers have shifted significantly over time, with agricultural producer support first declining after the country's independence, then increasing again between the mid-1970s and the mid-1980s, and afterwards moving towards an incentive-neutral stance. The sectoral averages hide large support differences across commodities though. Export commodities have consistently been explicitly or implicitly taxed, while import-competing commodities have benefitted from producer support through tariff and non-tariff barriers and, to a lesser extent, budgetary payments. In this context, recent policy reforms towards greater regional and global trade integration promise to remove the remaining anti-trade bias and provide producers with a more market-friendly policy environment.

The remainder of the discussion falls into five parts. The next section provides an overview of economic developments and structural changes in Nigeria. The agricultural policies that were pursued during the colonial period are briefly discussed before greater detail is provided on agricultural and food policies since the country's independence in October 1960. That sets the stage for the section that provides quantitative indicators of producer support and taxation and discusses the underlying policies. The final section reflects on prospects for more agricultural and trade policy reform.

Economic performance over time

Nigeria's long-term economic performance has been lackluster. Between 1950 and 2004, gross domestic product per capita increased on average by merely 1.1 percent per year. Similar to the general trend in Africa, economic growth fell well short of the economic expansion in other

developing regions such as East Asia and Latin America, and was only half as vigorous as world-wide growth (Appendix Figure 2). The poor long-term performance is partly due to the strong economic contractions that Nigeria experienced first in the run-up to and during the Biafran war (1967-70), and then during the post-oil boom period in the early 1980s when rigid economic policies hampered adjustment to lower oil prices and higher interest rates (Pinto 1987). Ultimately the country pursued a structural adjustment program (1986-1994), which was sponsored by the International Monetary Fund and the World Bank, to stabilize the economy and put it back on a growth path. The return to a democratic government in 1999 further set the stage for greater market orientation, and a number of fundamental economic reforms have been initiated since 2003, such as the accelerated privatization of state enterprises and the reduction of trade barriers.

Before independence and up until the late 1960s, Nigeria's economy was dominated by agricultural activities in terms of the sector's contribution to national GDP, employment, and exports. But the discovery and commercial exploitation of petroleum soon led to a fundamental structural transformation of the economy. Between the mid-1960s and the mid-1970s, the share of value added generated by the agricultural sector fell by almost half to less than 30 percent (Appendix Figure 3), while the corresponding share of the fuels and mining sector expanded. The contribution of manufacturing to aggregate value added doubled to almost 10 percent by the early 1980s, but then fell back to 5 percent in the 1990s. The services sector gained in relative importance in the early years after independence but peaked at 45 percent in 1970. By the late 1980s the share of services in aggregate value added had declined below the 30 percent share that had prevailed in the early 1960s.

The growth of the petroleum sector at the expense of other parts of the economy, notably agriculture, is mirrored in other economic indicators. In particular, the relative importance of agriculture as an employer started to decline markedly in the early 1970s, such that the sector's share in total employment halved over the subsequent 30 years. The most dramatic change, however, occurred with respect to Nigeria's export structure. Until the mid-1960s, agricultural exports accounted for more than 70 percent of total merchandise exports, but this share had dwindled to less than 5 percent a decade later and has never recovered (Appendix Figure 4).

Within agriculture, there have been some notable shifts in the pattern of production over time. Livestock production expanded almost continuously after Nigeria's independence, while

crop output dropped during the 1970s and early 1980s when the economy switched towards petroleum exploitation (Appendix Table 1). Due to the predominant importance of crops for feeding the growing population, domestic production of food per capita declined markedly. Subsequently, crop output and food availability outpaced the growth of the population, and since the early 1990s the food per capita ratio has surpassed the level that prevailed at the time of independence.

The long-term growth of agricultural output was mainly driven by root crops. Production of cassava has more than quadrupled since the early 1960s, and yams output increased nearly six-fold. In contrast, traditional export crops such as cocoa, groundnuts, and oil palm fruit, and most cereals, showed below-average production growth. As a result, cassava and yams now account for more than 50 percent of the total value of Nigeria’s agricultural production (Figure 1).

Policies before independence

During the colonial period, Nigeria’s economy was largely geared towards exports of agricultural raw materials. British administration in the country formally began in 1861, when Lagos became a crown colony, and by 1906 present-day Nigeria was under British control. The administration built a railroad network and constructed roads at an accelerating rate after the 1930s. These infrastructural investments, along with the introduction of the pound sterling as the universal medium of exchange, facilitated export trade in cocoa, cotton, groundnuts and palm oil (Wells 1974). Most of this trade occurred directly with Britain: as late as 1955, 70 percent of Nigeria's exports were destined for the home market of its colonial power, and 47 percent of its imports originated in Britain.

Three periods during the colonial era can be distinguished (Helleiner 1966). The first of these is the period of rapid and sustained export growth from 1900 to 1929, the second is the period of depression and wartime regulation during 1930-45, and the third is the period of slow recovery between 1945 and independence in 1960. Governmental involvement in agricultural production increased markedly during World War II: marketing boards pegged the prices of

agricultural commodities below the world market rate, workers faced wage ceilings, traders encountered price controls, and Nigerian consumers experienced shortages of imported goods.

After 1945, agricultural prices recovered and export growth resumed. The government's role in the economy shifted from strict control to fiscal management. The centralized single-commodity war-time marketing boards were transformed into regional multi-crop organizations in 1954 (Oyejide 1986a), and the share of government expenditure in GDP increased from 3.4 percent in 1950 to 6.2 percent in 1962. There was a notable increase in capital expenditure, but the funds were allocated mostly to social services, transport and communication, while industry and agriculture received less than 10 percent of the investment budget. Moreover, the funds that went into agriculture were focused on improving and enhancing export agriculture; public authorities devoted little attention to subsistence crops and their producers, so the majority of Nigerian farmers did not benefit from the governmental spending programs.

Incentives and disincentives to agriculture

Since independence, agricultural policy in Nigeria has been characterized by instability and inconsistency. Frequently changing governments tried to make their mark by adopting entirely new policies and programs, so that many initiatives were formulated and scrapped in rapid succession. There was generally a lack of focus on effective implementation, with the result that many policies were undermined by bureaucratic inertia, poor management and corruption. Moreover, inadequate institutional arrangements for policy and program coordination often led to duplication of effort and inefficient resource use among agencies and ministries of the same government, between federal and state agencies, and between agencies located in different states.

Four distinct phases of agricultural policy making can be distinguished (Manyong et al. 2003, World Bank 2006a, Daramola et al. 2007). During the 1960s, governments continued to pursue an export-oriented, laissez-faire attitude towards agriculture. Public policy remained largely confined to agricultural research, extension and export crop marketing, with most activities and institutions being region-based. Agriculture was the country's major foreign exchange earner and an important source of fiscal revenues through export taxation. The end of

the decade saw a marked contraction in export agriculture, but this development was initially seen as temporary and related to the Biafra war (1967-1970).

After the end of the Biafra war, and in face of the persistent decline in agriculture, the policy paradigm changed fundamentally: during the second phase, which spanned the period 1970 to 1986, heavy governmental intervention in the agricultural sector became the norm. There was a feeling that the increasingly serious problems of agricultural production and food supply required strong governmental engagement, including from federal authorities. The emerging inflows of fiscal resources from oil exports provided the government with the financial means to launch a multitude of agricultural policies, programs, projects, and institutions. Major new initiatives included the elimination of export taxes, the reduction of import tariffs on agricultural inputs, the establishment of national commodity boards to administer guaranteed minimum prices, the provision of substantial subsidies for fertilizer use and other farm inputs, and the launch of agricultural credit support schemes. These policies did not, however, yield the hoped-for benefits for agricultural development, and Nigeria evolved from a net-exporter of agricultural crops to a large-scale importer of agricultural and food products during this period. Eventually, the high fiscal spending and prevalent state control proved unsustainable when revenues from oil exports plummeted and government debt levels surged in the early 1980s.

The beginning of the third agricultural policy phase coincided with the launch of economy-wide structural adjustment reforms, as a result of which government largely withdrew from directly controlling production activities. Government expenditure was cut back, subsidies and price controls were withdrawn, and input and output marketing activities were liberalized. The currency was devalued with a view to strengthen the price competitiveness of export commodities and import-competing goods. Moreover, trade policy reforms were implemented with the aim to diversify the production and export base (for example through non-fuel export subsidies), and to increase the country's self-sufficiency for food and agricultural raw materials, including via import bans.

The fourth phase came about with the restoration of democracy in 1999, and has been marked by efforts to create a business environment that is susceptible to greater private investment in the agricultural sector. A new agricultural policy strategy was published in 2001 that spelt out definitive responsibilities for the federal, state and local governments in order to remove duplicated roles and overlapping functions. Greater control over policy implementation

was exercised, for example through a fundamental scaling back and reform of the non-fuel export subsidy regime that had been undermined by corruption and fraud. Moreover, in October 2005, Nigeria adopted the ECOWAS common external tariff, which involved a substantial reduction in import duties, and reaffirmed the country's commitment to its regional partners to phase out the remaining special tariffs on sensitive products and quantitative import restrictions by the end of 2007.

Methodology and data to measure agricultural distortions

Those four different policy phases presented producers with noticeably differing distortions to prices. Using the methodology detailed in Anderson et al. (2008), this study estimates the nominal rate of assistance (NRA) to farmers. The main focus is on government-imposed distortions that create a gap between domestic prices and what they would be under free markets. Hence, the analysis is based on the assumption that the country under scrutiny, in this case Nigeria, is small relative to the world market and hence that domestic policies do not influence international prices.

Since it is not possible to understand the characteristics of agricultural development with a sectoral view alone, the project's methodology not only estimates the effects of direct agricultural policy measures (including distortions in the foreign exchange market), but it also generates estimates of distortions in non-agricultural sectors for comparative evaluation. More specifically, we compute Nominal Rates of Assistance (NRAs) for farmers including an adjustment for direct interventions in input markets, and an NRA for nonagricultural tradables for comparison with that for agricultural tradables via the calculation of a Relative Rate of Assistance (RRA – see Anderson et al. 2008).

The conversion of import and export parity prices to local currency is carried out at an equilibrium exchange rate that is estimated from the official rate and the proportion of export receipts traded on the parallel or sanctioned secondary market (when there were retention schemes for exporters) or the illegal (black) secondary market for foreign currency. In Nigeria, the institutional arrangements up to 1986 have been such that all import and export transactions had to take place at the official exchange rate, while subsequently non-fuel trade occurred at the free market rate.

Unit border prices for imports and exports were obtained from trade volume and value data published by FAOSTAT. Information on domestic producer prices comes from several different sources. Most recent farmgate prices for the period 1982-2004 were obtained from the Federal Office of Statistics and (for cocoa and palm oil) from the Central Bank of Nigeria. Earlier information on producer prices was based on Oyejide (1986a) for 1961-62, Oyejide(1986b) for 1963-1976, and Robertson (1983) for 1977-81. It should be noted that different sources sometimes report quite divergent price information, and the selection of the price data sources was undertaken with the aim of using the same source across the largest number of commodities and years in order to minimize bias from differing reporting methodologies.

The available information on transport, marketing, and processing margins showed large variability over time, to the extent that differences in margins appeared to be caused by data problems rather than underlying changes in cost structure. In order to minimize the impact of these data problems on the policy analysis, data on margins reported in Robertson (1983) for the late 1970s and early 1980s were averaged, converted to ad valorem equivalents, and taken as representative for the entire study period. The quality of domestically produced and consumed products was assumed to be identical to that of traded commodities.

If exports exceeded imports and accounted for more than 2.5 percent of domestic production, a commodity was classified as an exportable. Conversely, if imports exceeded exports and accounted for more than 2.5 percent of domestic production, a product was classified as import-competing. Commodities were classified as (non-tradable) home goods if neither exports nor imports accounted for 2.5 percent or more of domestic production. Multi-year averages were thereby considered to avoid commodities switching their tradability status frequently.

A dominant share of the products not individually covered in the quantitative analysis are fruit and vegetables, which are rarely traded and, hence, can be qualified as home goods. Yet, about one tenth of the value of the uncovered agricultural output consisted in 2004 of exportables, such as ginger, natural rubber, and cashew nuts. At the same time, about one third of the value of uncovered agricultural production consisted of import-competing products, notably livestock products, wheat, and tobacco. The evolution over time of the value of

exportables and import-competing products in the uncovered commodities group was assumed to follow the trend of the respective groups of covered products.

The shares of different non-agricultural sectors were derived from data on value-added in the World Bank's World Development Indicators database. In addition, it was assumed that the food industry and the beverage and tobacco industry, respectively, accounted for 20 percent and 2 percent of the total manufacturing value-added, which corresponds to the sectors' employment share. Information on tariff protection for the different non-agricultural sectors was obtained from UNCTAD's Trains and WTO's Integrated databases.

Total governmental expenditure on agriculture at the federal, regional, and local level was assumed to amount to twice the spending of the Federal Government. Half of this amount was taken to benefit agricultural producers through production-related subsidies, such as fertilizer subsidies. That part of the budgetary support is allocated across commodities in proportion to the production value of the latter, while the rest is treated as non-product-specific assistance to farmers.

NRA patterns

The weighted average NRA for covered agricultural products (which account for around 70 percent of all farm products valued at undistorted prices) fell gradually from above 20 percent in the early 1960s to below 10 percent in the 1970s, then rose to 15 percent in the latter 1980s before falling gradually over the 1990s as the structural adjustment program came into force – and then becoming negative on average in the most recent decade (Table 1).

Throughout the past five decades the dispersion of NRAs across the ten covered products was huge though. Even though the standard deviation is now only half what it was prior to the 1990s, it is still over 50 percent. That high intra-sectoral variance in covered NRAs suggests the welfare cost of agricultural programs has been higher than might be implied by the relatively low average NRA for the sector.

In particular, while producers of import competing crops, such as maize, rice, and sorghum have benefited from substantial governmental support throughout the post-independence period, the producers of traditional export crops such as cocoa beans, cotton, groundnuts and palm oil have implicitly or explicitly been taxed by governmental policies in

most years. This difference has narrowed over time, however, and the strong anti-trade bias in the structure of Nigeria's agricultural distortions of the past has largely disappeared (Table 1 and Figure 2). Meanwhile, agricultural non-tradables, namely cassava, millet and yams, have been subject to relatively little intervention and their NRAs have been close to zero most of the time (see middle rows of Table 1), while turning negative since the introduction of the value-added tax in 1994. Our assumed NRA values for the roughly 25-40 percent of the agricultural sector's products we have not covered do not alter the sectoral average NRA very much, nor does not-product-specific assistance except in the first half of the 1980s (see upper half of Table 2).

RRA trends

Because of the low rates of assistance to nontradable farm products, and the large weights of them and of highly ptotected import-competing products within the farm sector (see Figure 1), the NRA for just tradable agricultural products is substantially higher than for the sector as a whole. It is also much higher than the NRA for non-agricultural tradables (which is dominated by petroleum, as manufacturing is well under 10 pecent of GDP). Hence over the period to the mid-1990s the RRA is between 25 and 67 percent, suggesting that on average the price of tradable farm products relative to that for nonfarm tradables has been inflated by policies by between one-quarter and two-thirds. The premium was slightly lower at one-fifth in the latter 1990s, and by the first half of the present decade that difference had disappeared – suggesting that, for the first time since Independence, there was no longer an incentive to have more resources in agriculture than would be the case without product price distortions (Table 2 and Figure 3).

The final three rows of Table 2 show what the agricultural NRA (including nontradables), the trade bias index and the RRA would be if we had ignored the exchange rate distortions. Since the 3 crops that produce nontradables account for roughly half the value of farm production (see Figure 1), it is not surprising that the exchange rate distortion does not have a large effect on the overall agricultural NRA (cf rows 5 and 12). But it does have a significant effect on the RRA for tradables: if we had ignored that distortion, the RRA would have still trended slightly upward prior to the 1980s and steeply down to zero after the 1980s, but the absolute size of the RRA would have been overestimated prior to the 1980s and underestimated since then.

Factors driving policy developments

The persistent divergence between domestic and world parity prices that is revealed in the above agricultural NRAs can be attributed to several forms of governmental intervention including exchange rate policies, tariffs and quantitative restrictions on imports or exports and associated licencing requirements, and domestic market price supports and budgetary payments.

Exchange rate policies

Exchange rate policies have had a marked impact on agriculture. Nigeria has pursued a policy of maintaining a relatively constant nominal exchange rate in the face of strong real exchange appreciation due to petroleum related capital inflows. The resulting real appreciation of the currency squeezed non-oil tradables, notably agricultural commodities. The opposite occurred when petroleum prices slumped, as in the mid-1970s and again in the mid-1980s.

Up to 1986, there was a legal requirement for exporters to render all foreign currency to the Central Bank at the official exchange rate. Imports were subject to licensing requirements and the government set annual quotas for “essential” and “non-essential” imports. The difference between the official exchange rate and the black market rate was considerable during periods of overvaluation, with spikes of several hundred percent in the mid-1980s and mid-1990s (Figure 4). The overvaluation served as an implicit impediment to producers of agricultural and other export crops. But insofar as importers had to pay more than the equilibrium price for foreign exchange, the regime also serves as an implicit tax on imports and hence a form of protection to import-competing producers. We have therefore adopted the project’s methodology (see Anderson et al. 2008) to incorporate those implicit trade taxes in the calculation of the above NRAs for farm and non-agricultural sectors.

Border taxation

Since independence, Nigeria whole-heartedly embraced an import substitution strategy to foster industrialization. Manufacturing industries received high levels of protection through tariffs and quantitative restrictions, which had the effect of pushing up manufacturing wages and the costs of manufactured inputs to the detriment of other sectors, notably agriculture. Moreover, up to the mid-1970s, agriculture was seen as a reservoir for resources to support the process of industrialization.

For a long time, agricultural trade policy was primarily determined by balance of payment considerations. Import tariffs, export duties and quantitative restrictions, such as import bans and licensing requirements, were used to adjust the level of imports to the available foreign reserves. Since the 1970s, tariff escalation, with high rates on finished products and lower ones on inputs, gradually took root and tariff reforms in 1978 and 1982 introduced high import duties of 50 to 100 percent for food commodities such as maize, rice, wheat and sorghum, while tariffs on production inputs and capital equipment were set in the range of zero to 15 percent (Oyejide 1986b). Tariffs on agriculture and food have been very high (averaging 30 and 35 percent in the 1990s and even higher since 2002), exceeding the import duties on primary non-agriculture and non-food manufacturing which averaged around 20 and 25 percent in the 1995-2004 period (Appendix Figure 5).

Up until the mid-1970s, exports of agricultural produce were subject to taxation. In fact, they were taxed through three different means: export duties, sales taxes, and the marketing board surpluses (World Bank 1973). From independence to 1977, export duties levied by the federal government amounted to 15-20 percent. In addition, sales taxes were levied, collected and retained by state governments based on the volume of produce delivered to the Marketing Boards.

The third form of export taxation consisted of the trading profits of the Marketing Boards, which have fluctuated considerably over time. The Boards were the major instrument of agricultural commodity marketing and pricing policy since their establishment as regional, multi-commodity organizations in 1954. Producers were required by law to sell their crops at officially determined prices to the boards, which were the sole exporters for the products covered. In 1977, the existing regional boards were replaced by six new national commodity boards responsible for the marketing of cocoa, groundnut, palm produce, cotton, rubber, and food grains (Manyong et al. 2003).

Domestic market price support

The creation of the grains marketing board was particularly remarkable as it represented a first effort to extend the marketing board system to cover food crops. The National Grains Board handled maize, millet, sorghum, wheat, rice and cowpeas. It administered a guaranteed minimum price policy whereby floor prices were nationally set for each of the six grain crops as guaranteed minimum prices at which the board would intervene as a buyer of last resort (Manyong et al. 2003). However, the official floor prices had little effect, as they were set substantially below farmgate and retail prices: since farmers were free to sell on the open market, the National Grains Board made very few intervention purchases (Oyejide 1986b).

Non-tariff measures

Nigeria has been making extensive use of non-tariff barriers, notably import bans, to shelter domestic producers from foreign competition. The practice of prohibiting imports of selected products was widespread in the 1980s and early 1990s, and after the national government replaced a number of prohibitions with high tariffs from the late 1990s, major expansions in the list of prohibited imports occurred again in 2001, 2003 and 2004. In November 2005, 944 tariff lines (down from 1130 lines in January 2004) were subject to import bans. In other words, nearly a fifth of all products in the tariff schedule could not be legally imported into Nigeria. In addition, there were partial bans in 76 tariff lines, which mostly relate to imports of consumer durables in used form or prescribe minimum import quantities or specific import locations. Ruffer (2004) estimates that banned products might, in the absence of the prohibitions, account for 5-10 percent of total imports.

Frequent changes in trade regulations have also been harmful. For example, the 1988 ban on vegetable oil imports induced large-scale investments in domestic production capacity. When the ban was lifted four years later, the market was flooded with imports and the uncompetitive domestic industry suffered losses.

In addition to the often unpredictable, yet official barriers to imports in the form of tariffs and import prohibitions, there are substantial informal trade barriers in Nigeria’s logistics sector

that add further distortions to the import regime. Importers face long clearance procedures, high berthing and unloading costs, erratic application of customs regulations, and corruption. A recent World Bank project collected information on the number of necessary documents and signatures as well as the time required to undertake import or export transactions. Nigeria scores worse than regional comparators in all dimensions (World Bank 2006b).

Budgetary payments

In addition to influencing producer prices, the government has also tried to foster agricultural development through direct spending policies. Public funds were made available to improve rural infrastucture and institutions, and to subsidize production inputs, notably fertilizer, and agricultural credit. Public outlays for agriculture and rural development by federal, state, and local governments are reported by the authorities as recurrent and capital expenditure. Unfortunately, consistent and reliable data are only available for the approved budgets, not the executed ones. Also, a substantial part of actual spending has occurred through extra-budgetary means, such as Authorized to Incur Expenditure arrangements and stabilization accounts (World Bank 1996). Hence, the available budgetary information can only be indicative of the support actually received by farmers.

The budgeted funds available for agriculture have fluctuated considerably over time, both in terms of absolute outlays and budget shares (Garba 2000). During the late 1970s and early 1980s, the federal government significantly increased its spending, such that the share of agriculture in the total budget exceeded 10 percent by 1983 (Appendix Figure 6). During the subsequent structural adjustment period, the budget share fell back to an average of about 3.5 per cent. This dropback was somewhat cushioned through continued agricultural loan assistance from international development partners, whose funding increased in relative importance from one-tenth to one-quarter of federal outlays during the structural adjustment period (World Bank 2001).

In addition to spending at the federal level, state and local governments have had their own spending programs, which frequently overlapped with federal initiatives. The relative importance of agriculture varies widely across state budgets, ranging during the 1980s and 1990s from less than 1 percent to more than 10 percent, with most states, similar to the federal

government, devoting the bulk of funds to capital improvements rather than recurrent expenditure (World Bank 2001). By contrast, local authorities, who support agriculture through funding programs for road maintenance, rural health facilities, and community development, spend most of their funds on a recurrent basis. While no reliable figures on overall agricultural spending are available, estimates of the share of federal in total spending range from 40 per cent to 60 percent.

One of the most prominent governmental program in the agricultural sector has concerned fertilizer subsidies, which accounted at times for half of total agricultural spending. Since the 1950s, regional governments increasingly arranged purchases of fertilizer and other key inputs for resale at an official, subsidized price, with a focus on supporting the production of export crops. In 1976, the Federal Ministry of Agriculture assumed responsibility, with the states and local governments taking on parts of the costs of the subsidy as well as the expenses related to distribution. At the same time, the program was extended to cover food crops.

Available information indicates that subsidy rates have been very high at 75-85 per cent during late 1970s to mid 1980s, before falling to less than 60 percent in the mid-1990s (Etuk 1986, World Bank 1996). Other production inputs, such as improved seeds (50 percent subsidy rate), agro-chemicals (50 percent), and tractor services (25 to 50 percent) also received governmental support (Manyong et al. 2003). However, inefficiencies and lack of timeliness in the distribution system frequently undermined the programs and further raised their costs.

Another means of financial support to agriculture has consisted of concessional credit and credit guarantees. The National Agricultural Cooperative and Rural Development Bank was established in 1972 at the federal level to channel financial funds at concessional rates to individual farmers and farmers' cooperatives. In 1977, the Agricultural Credit Guarantee Scheme Fund (ACGSF) was set up to counter the shortage of credit available particularly to small-scale agricultural producers. The Fund was jointly established by the federal government (60 percent of the paid-up capital) and the Central Bank (40 percent), and provides guarantee cover for loans to agricultural producers through participating commercial banks. The cover pledges to pay the banks 75 percent of any outstanding default balance under the condition that existing collateral has been realised (Olaitan 2006).

The loan portfolio of the ACGSF build up quickly during the pre-structural adjustment period, and reached 0.2 percent of GDP in 1985 and 1986. Subsequently, the Fund rapidly

became less important. Concerning the supported production activities, there was a shift away from support for livestock operations, which were important during the boom phase of the Fund, towards food crops, which since the late 1980s have accounted for the majority of the guaranteed loans. During the period from 1978 to 2004, a total of almost 400,000 loans were guaranteed by the ACGSF, of which about 250,000 (64 percent) have subsequently been fully repaid (Olaitan 2006). The costs of covering the guarantees for non-performing loans have been financed out of the retained earnings on Treasury bonds that the ACGSF has been accumulating over time.

Recent developments and prospects for domestic policy reform

The democratically elected government that came to power in 1999 has realized the shortcomings of past policies and has embarked on reforms of the country's policies that are imposing distortions to agricultural and other sectors' incentives. In 2002, the government approved a Trade Policy Document prepared by the Ministry of Commerce that contains an ambitious and comprehensive agenda for policy and institutional reform on trade policy. Moreover, the National Economic Empowerment and Development Strategy (NEEDS) of 2004 confirms the government's intention to lower or remove barriers to trade. Since then, the national government has launched major initiatives to modernize Customs and port management, and it adopted the ECOWAS common external tariff (CET) in October 2005.

The adoption of the CET implies a major change in Nigerian trade policy. The ECOWAS CET consists of four bands (zero, 5, 10 and 20 percent), similar to those already being applied by members of the West African Economic and Monetary Union, which is composed of a sub-set of ECOWAS member countries. During the transition period until the end of 2007, Nigeria applies 50 percent duty rates to imports in 102 tariff lines, or 1.9 percent of all lines. The resulting tariff profile is significantly less dispersed and carries lower average duty rates than Nigeria's pre-CET schedule. Indeed, after having reached almost 30 percent in the recent past, the adoption of the CET is bringing simple average import duties down to 12.1 percent (11.6 percent once the CET is fully implemented in 2008). The liberalization is particularly marked for agricultural products, which formerly received high protection.

What are going to be the impacts of the ongoing trade reforms, and how are poor people, in particular, being affected? Predicting the effects of trade regime changes on income distribution is a complex and challenging undertaking. The extent to which trade policy changes alter the prices of goods and services that are produced and consumed by poor households will naturally have a major impact on poverty levels. Moreover, price transmission, labor market flexibility, and the incidence of replacement taxes will have to be taken into account, although tax replacement is likely to be of lesser significance than in many other developing countries given Nigeria's relatively minor dependence on trade taxes.

Nigeria's Federal Office of Statistics carried out a household survey in 2004 and found that the prevalence of poverty in the country had fallen over time, but that more than half of all Nigerians continue to live with less than one US dollar per day to spend (Federal Office of Statistics 2005). As in many other countries, the share of households living in poverty is higher in rural (61 percent) than in urban areas (40 percent).

Some insights into how poor households will likely be affected by ongoing trade reforms can be obtained by assessing the impact of liberalization on the production and consumption patterns of the poor. The very poorest households tend to consume a relatively large amount of food, but they produce it themselves rather than rely on the market. Poor people in general spend a larger share of their monetized income on food than richer households. In Nigeria, the richest quintile of households devotes less than 43 percent to food purchases, while poorer households spend up to 60 percent on food. Hence, any change in food prices has a more pronounced impact on poorer than on richer households. The tariff changes due to the adoption of the ECOWAS CET imply that average import duties on agricultural products are falling from 41 percent to 13 percent, while duties on manufacturing goods are being reduced from 28 percent to 12 percent. Even if price transmission for agricultural products is somewhat lower than for non-agricultural goods, agricultural and food prices should decrease by more than non-food prices, thereby increasing the purchasing power of the poor by relatively more than that of richer households.

On the production side, the household survey reported substantial differences in the types of crops that different households grow. For example, there are two crops (eggplant and tobacco) for which more than half is grown by households in the poorest quintile. Conversely, there are three crops (coconut, papayas and pineapple) for which more than half is planted by the richest quintile of households. Neither eggplant nor tobacco are subject to import prohibitions, while

coconut, papayas and pineapple all are. Moreover, the tariff protection for tobacco under the old national tariff schedule (import duty of 15 percent) and the CET (5 percent) is substantially below the average for agricultural products, while coconut, papayas and pineapple each benefit from very high protection under the old regime (import duty of 100 percent) and the new import regime (20 percent). These observations suggest that rich households have in the past been able to influence the political process in a way that the structure of domestic market protection favors their interests rather than those of the poor. In this context, the full adoption of the CET and the phasing out of import prohibitions will reduce the anti-poor bias in the trade regime and put poor household producers on a more equal footing with their richer counterparts in terms of the policy-generated transfers they receive.

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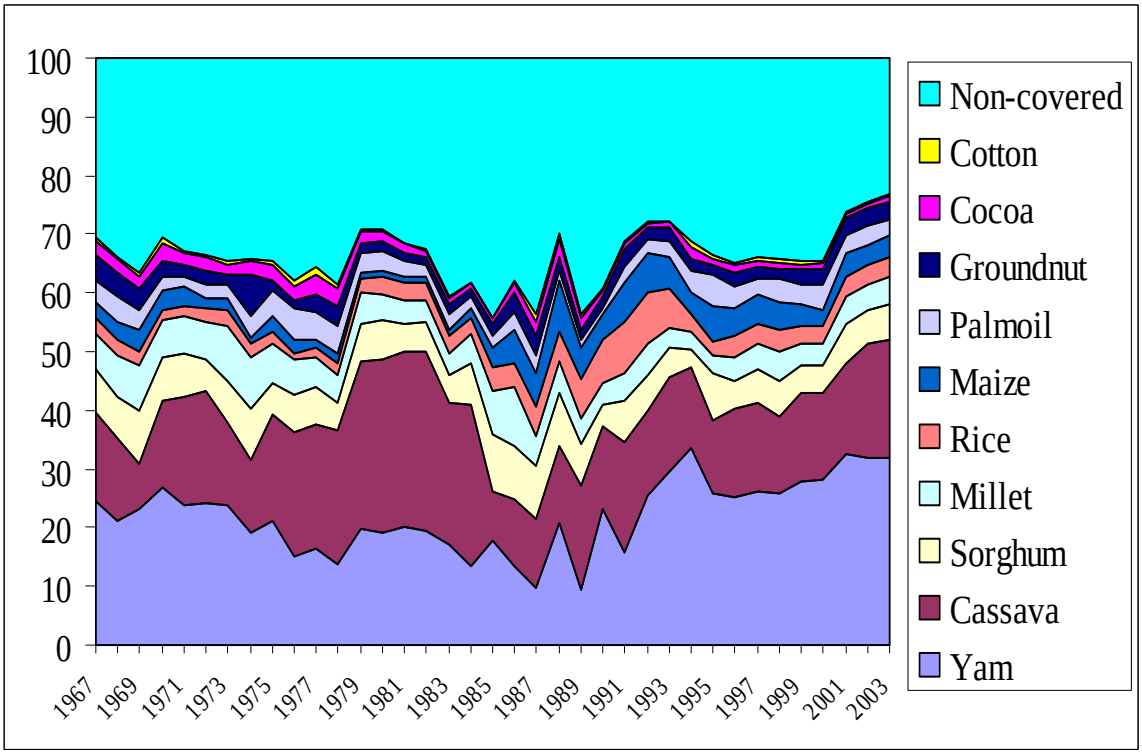
Figure 1: Agricultural production value, by commodity, Nigeria, 1967 to 2003

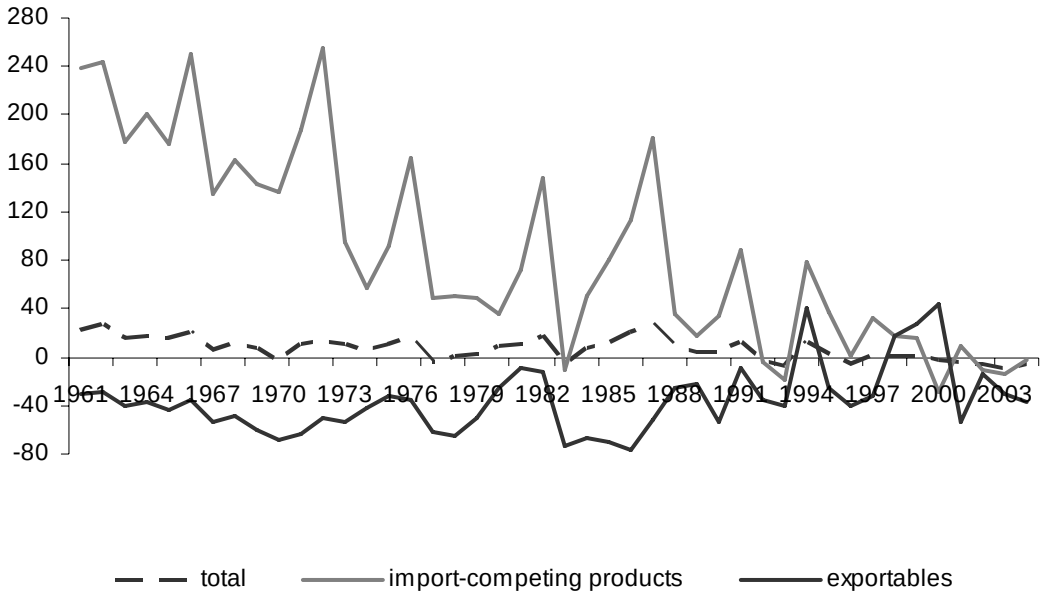
(percent at distorted producer prices)



Source: derived from FAO Faostat database

Figure 2: Nominal rates of assistance to exportables, import-competing and all[a] agricultural products, Nigeria, 1961 to 2004

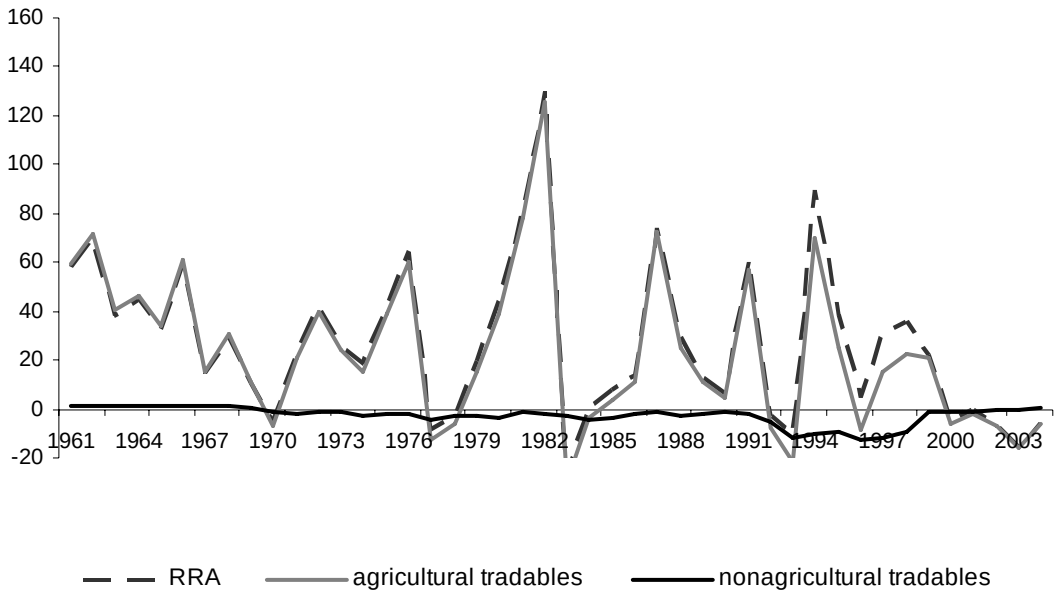
(percent)



a. The total NRA can be above or below the exportable and import-competing averages because assistance to nontradables and non-product specific assistance is also included.

Source: Author's spreadsheet

Figure 3: Nominal rates of assistance to all nonagricultural tradables, all agricultural tradable industries, and relative rates of assistance[a], Nigeria, 1961 to 2004
(percent)

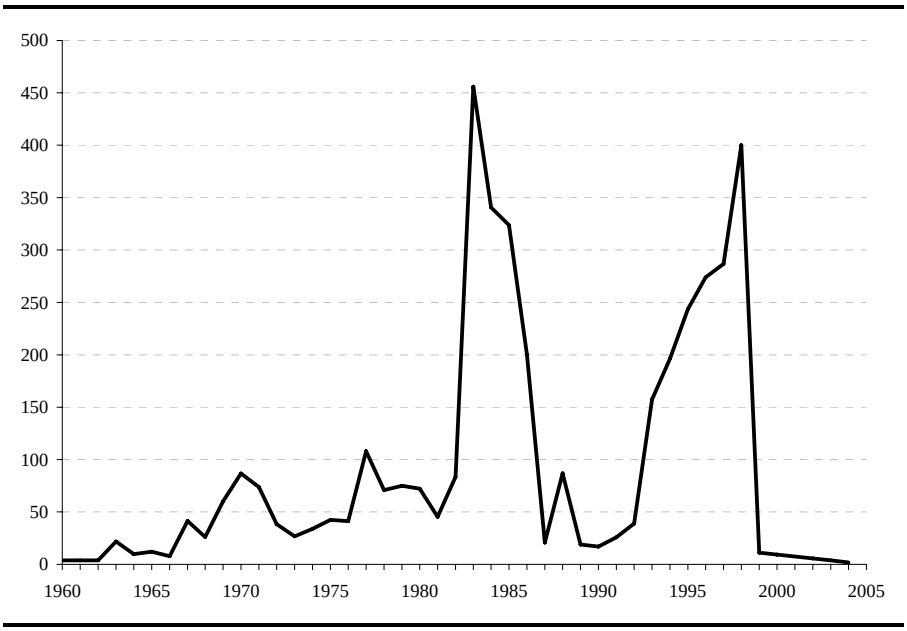


a. The RRA is defined as 100*[(100+NRAag^t)/(100+NRAnonag^t)-1], where NRAag^t and NRAnonag^t are the percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors, respectively.

Source: Author's spreadsheet

Figure 4: Black market premium over official exchange rate, Nigeria, 1960 to 2004

(percent)



Source: Cowitt (various years).

Table 1: Nominal rates of assistance to covered products, Nigeria, 1961 to 2004
(percent)

	1961-64	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04
Exportables[a, b]	**-34.0**	**-48.6**	**-55.8**	**-49.1**	**-37.3**	**-49.5**	**-19.6**	**-10.5**	**-18.0**
Cocoa	-35.1	-56.1	-48.9	-51.8	-22.1	-32.5	-4.5	2.6	-16.2
Cotton	-75.7	-66.9	-76.1	-71.7	-72.8	-75.3	-82.8	-82.7	-82.3
Import-competing products[a, b]	**214.9**	**173.2**	**146.1**	**81.0**	**58.7**	**85.4**	**35.6**	**20.9**	**-9.5**
Rice	64.7	21.1	37.3	28.5	49.4	66.5	11.1	-3.7	9.6
Nontradables[a, d]	**0.2**	**0.3**	**0.6**	**1.3**	**2.7**	**0.9**	**-0.7**	**-4.8**	**-4.4**
Cassava	0.3	0.4	0.7	1.5	3.2	1.0	-0.7	-4.8	-4.2
Millet	0.2	0.3	0.6	1.2	2.6	0.8	-0.7	-4.8	-4.4
Yams	0.2	0.3	0.5	1.0	2.2	0.7	-0.8	-4.8	-4.5
Mixed trade status[a]									
Maize	259.2	166.7	155.7	166.3	190.3	180.1	73.7	128.9	78.6
Sorghum	216.1	209.6	193.8	183.4	151.5	163.1	104.7	89.5	80.8
Groundnuts	-20.7	-45.5	-58.6	11.4	-30.1	5.6	-2.6	-43.6	-57.5
Palmoil	-24.9	-31.0	-44.2	-17.2	-25.3	-11.8	107.5	41.2	-12.6
Total of covered products[a]	**21.1**	**12.2**	**7.3**	**5.3**	**7.8**	**14.8**	**4.2**	**-0.1**	**-5.4**
Dispersion of covered products[c]	111.8	94.2	92.4	89.4	90.4	92.1	62.6	66.2	53.1
% coverage (at undistorted prices)	73	70	67	65	65	59	69	66	72

Source: Author's spreadsheet

a. Weighted averages, with weights based on the unassisted value of production.

b. Mixed trade status products included in exportable or import-competing groups depending upon their trade status in the particular year.

c. Dispersion is a simple 5-year average of the annual standard deviation around the weighted mean of NRAs of covered products.

d. The nontradables cassava, millet and yams have NRAs very similar to each other so only the average NRA for those 3 nontradables is shown.

Table 2: Nominal rates of assistance to agricultural relative to nonagricultural industries, Nigeria, 1961 to 2004
(percent)

	1961-64	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04
Covered products[a]	21.1	12.2	7.3	5.3	7.8	14.8	4.2	-0.1	-5.4
Non-covered products	17.9	9.4	2.3	2.1	1.1	-3.3	2.4	0.6	-9.3
All agricultural products[a]	20.3	11.3	5.7	4.1	4.5	6.9	3.5	0.1	-6.6
Non-product specific (NPS) assistance	0.4	0.6	1.1	2.3	4.9	1.3	0.4	0.3	1.2
Total agricultural NRA (incl. NPS)[b]	**20.7**	**11.9**	**6.7**	**6.3**	**9.4**	**8.2**	**3.9**	**0.4**	**-5.4**
Trade bias index [c]	-0.79	-0.82	-0.81	-0.74	-0.66	-0.70	-0.45	-0.36	-0.04
Assistance to just tradables:									
All agricultural tradables	54.4	30.5	18.7	19.2	41.8	24.8	20.7	14.9	-7.5
All non-agricultural tradables	1.4	1.1	-1.7	-2.9	-2.9	-2.2	-6.2	-9.0	-0.5
Relative rate of assistance, RRA[d]	**52.3**	**29.0**	**20.8**	**22.6**	**45.6**	**27.4**	**28.8**	**26.2**	**-7.0**
MEMO, ignoring exchange rate distortions:									
NRA, all agric. products	22.3	16.5	13.1	11.1	12.9	13.1	3.6	0.6	-5.5
Trade bias index [c]	-0.77	-0.76	-0.71	-0.53	0.00	-0.39	0.18	1.36	0.04
RRA (relative rate of assistance)[d]	57.7	41.6	39.1	35.0	53.0	41.7	21.2	15.5	-7.9

Source: Author's spreadsheet

a. NRAs including product-specific input subsidies.

b. NRAs including product-specific input subsidies and non-product-specific (NPS) assistance. Total of assistance to primary factors and intermediate inputs divided to total value of primary agriculture production at undistorted prices (percent).

c. Trade bias index is TBI = $(1+NRAag_x/100)/(1+NRAag_m/100) - 1$, where $NRAag_m$ and $NRAag_x$ are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector.

d. The RRA is defined as $100*[(100+NRAag^t)/(100+NRAnonag^t)-1]$, where $NRAag^t$ and $NRAnonag^t$ are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively.

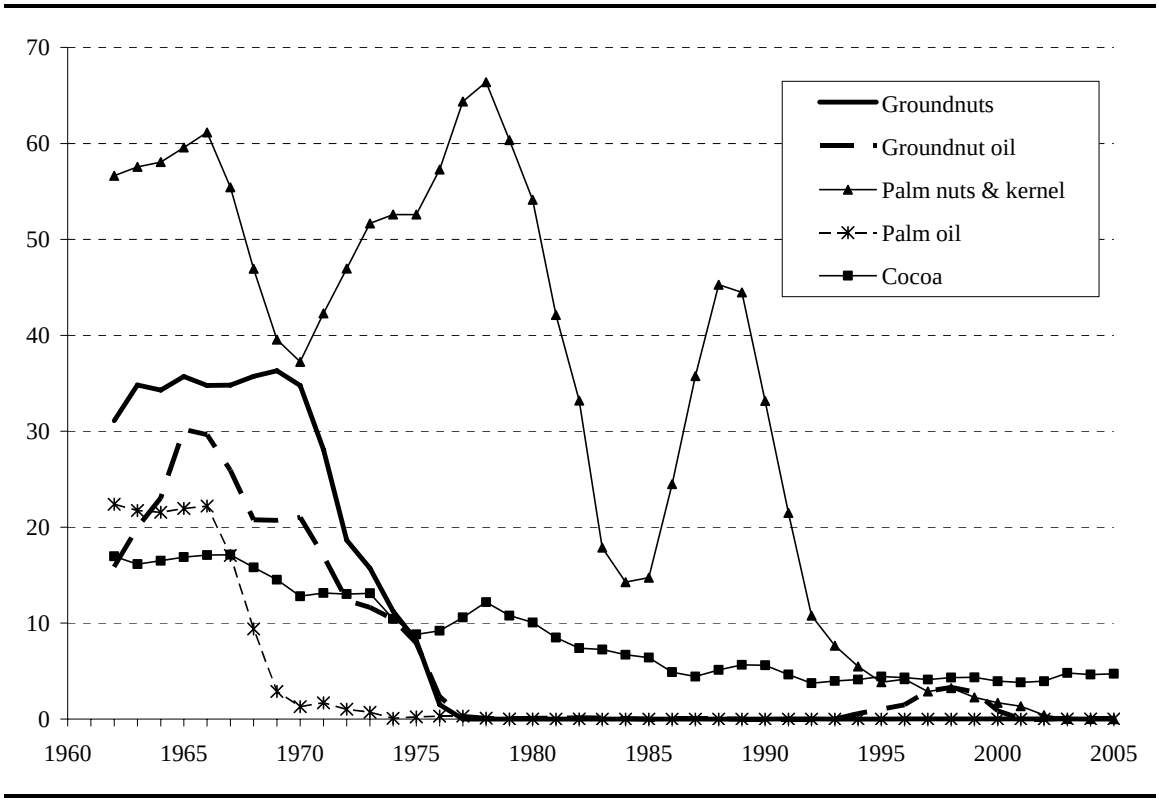
Table 3: Structure of annual household expenditure by income quintile, Nigeria, 2004 (in NGN)

Income quintile	Total per capita expenditure	Per capita non-food expenditure	Per capita food expenditure	Share of food in total expenditure (percent)
1	7 226	3 520	3 706	51
2	13 263	5 467	7 796	59
3	19 234	7 572	11 663	61
4	28 261	11 880	16 381	58
5	68 952	39 543	29 408	43
Average	35 600	18 506	17 094	48

Source: Federal Office of Statistics (2005).

Appendix Figure 1: Nigeria's world market share for major export crops, 1960 to 2005

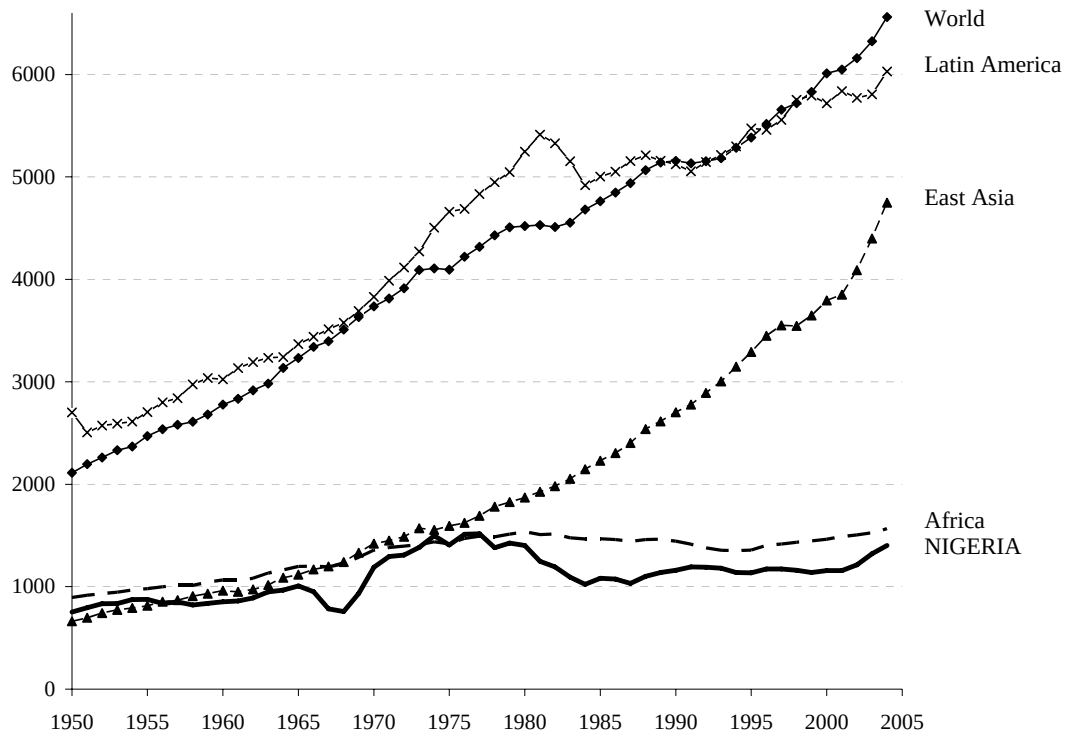
(three year moving average, percent)



Source: UN Comtrade database (using mirror data).

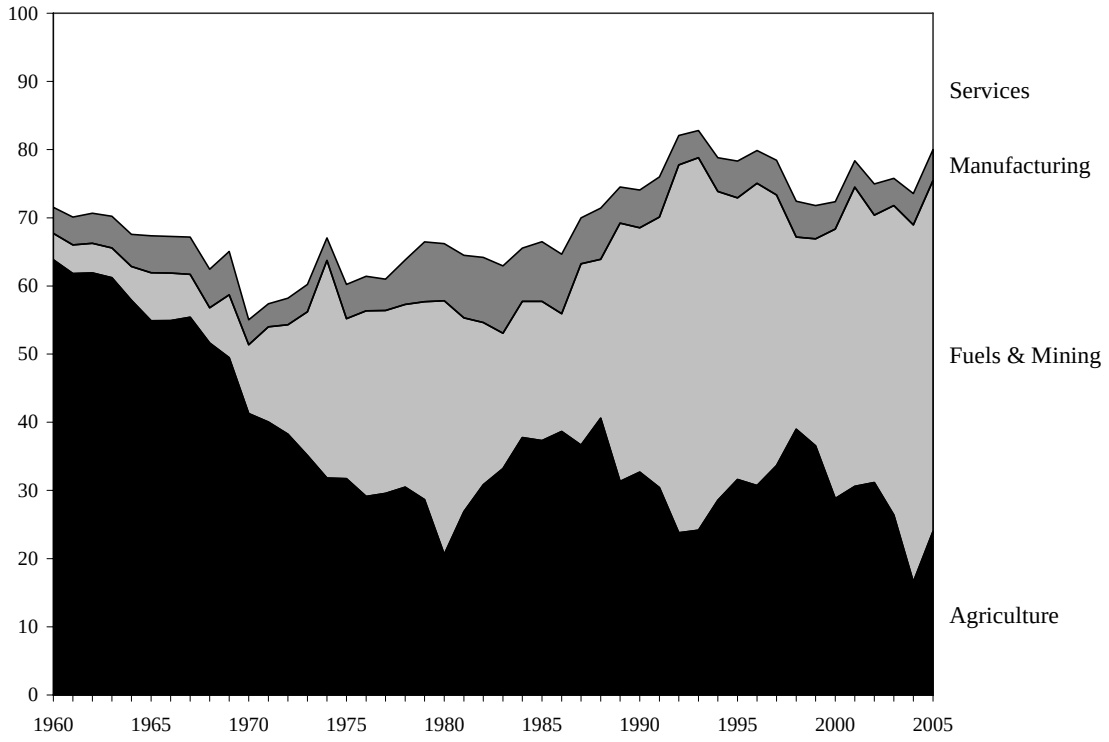
Appendix Figure 2: Gross domestic product per capita, Nigeria, 1950 to 2005

(purchasing power parities, 1990 US$)



Source: Maddison (2003) and World Bank (2007)

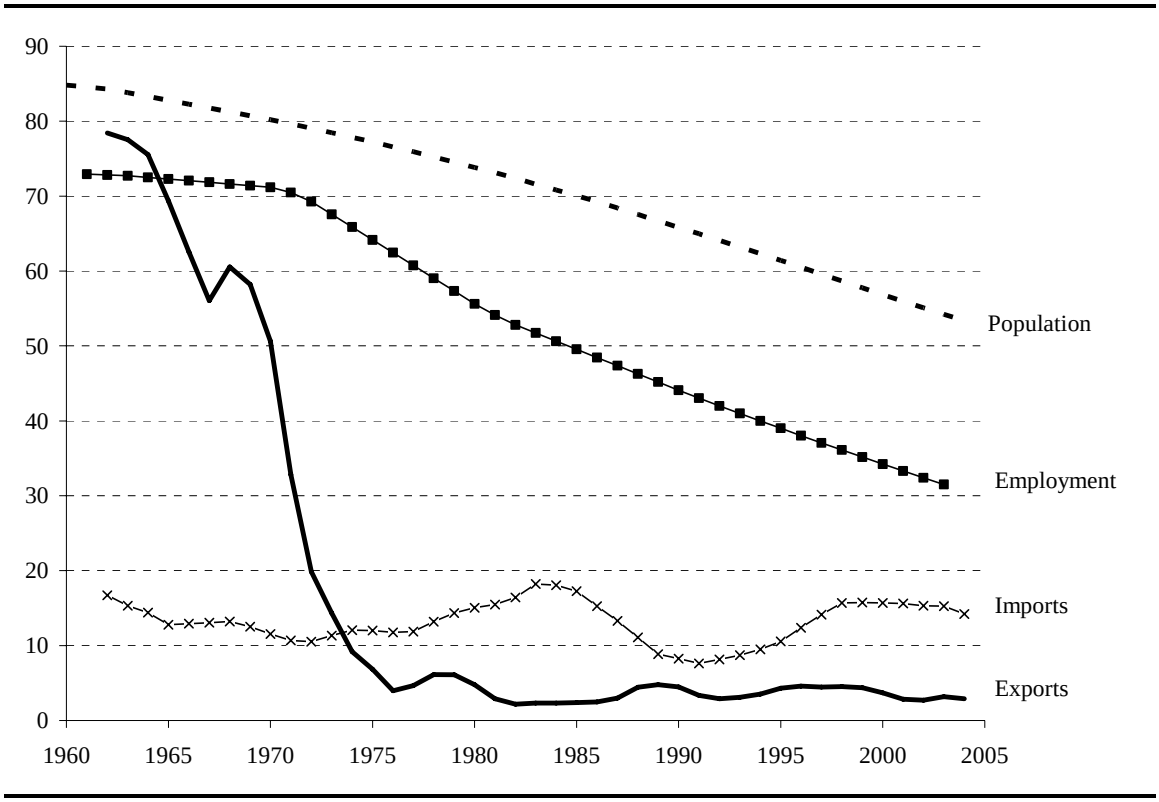
Appendix Figure 3: Gross domestic product by sector, Nigeria, 1960 to 2005 (percent)



Source: Iyoha (2002) and World Bank (2007)

Appendix Figure 4: Share of agriculture in the national economy, Nigeria, 1960 to 2005

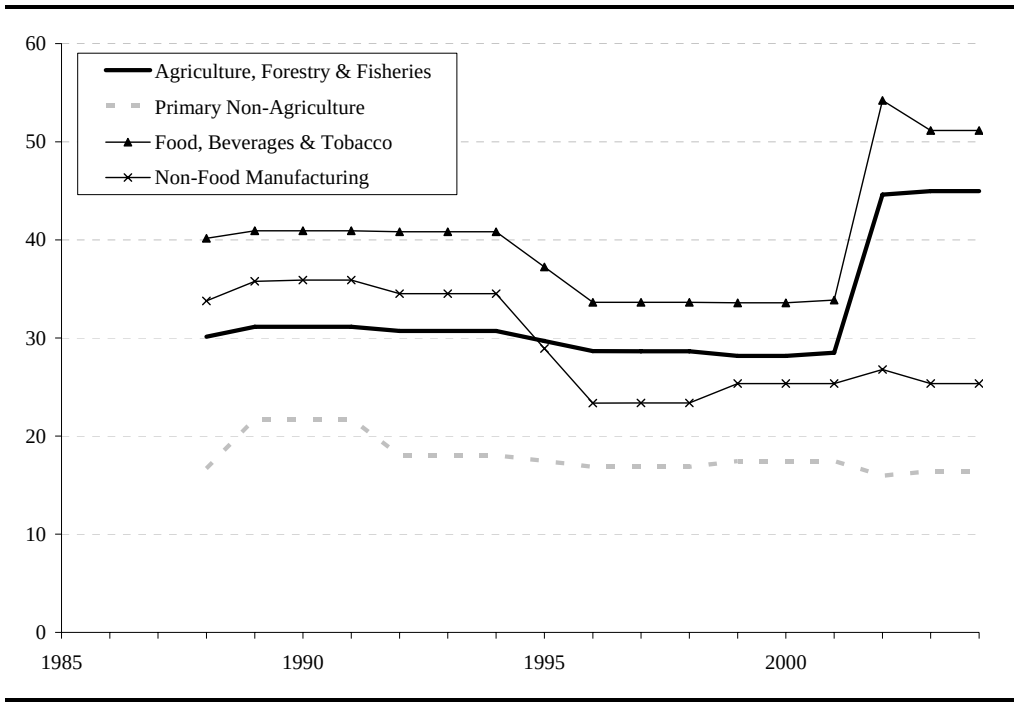
(three year moving average, percent)



Sources: World Bank (2007) (for information on rural population), FAO Faostat database (for employment), and UN Comtrade database (for imports & exports; using mirror data).

Appendix Figure 5: Unweighted mean of import duties, by sector, Nigeria, 1988 to 2004

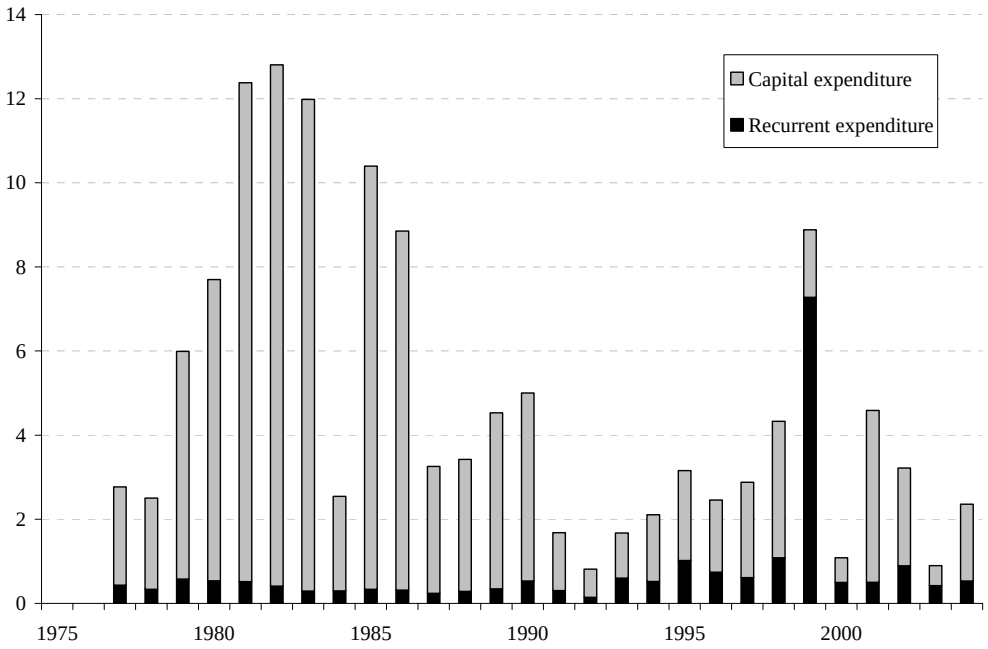
(percent)



Source: UNCTAD Trains database.

Appendix Figure 6: Share of federal government budgeted spending allocated to agriculture, Nigeria, 1977 to 2004

(percent)



Source: Central Bank of Nigeria.

Appendix Table 1: Agricultural output, Nigeria, 1961 to 2005
(Index of production volume, 2000=100)

	1961-65	1966-70	1971-75	1976-80	1981-85	1986-90	1991-95	1996-00	2001-05
CROPS	32	37	37	33	35	50	79	96	102
Cassava	24	28	30	36	35	49	92	101	109
Cocoa	64	72	68	49	47	62	82	93	105
Cottonseed	36	41	29	37	14	45	66	89	94
Groundnuts	64	59	41	19	19	33	48	91	97
Maize	27	28	22	17	27	118	155	125	115
Millet	43	43	56	41	49	72	77	97	100
Oil palm	80	68	63	66	63	74	86	96	105
Rice	6	10	14	18	39	67	90	98	99
Sorghum	54	47	44	39	53	65	79	96	101
Yams	17	34	30	22	19	32	80	95	101
LIVESTOCK	28	34	41	57	76	77	82	95	106
FOOD per capita	89	94	82	66	63	74	96	101	96

Source: FAO Faostat database and World Bank (2007)

Appendix Table 2: Annual distortion estimates, Nigeria, 1961 to 2004
(a) Nominal rates of assistance to covered products (percent)

	Cassava	Cocoa	Cotton	Groundnut	Maize	Millet	Palmoil	Rice	Sorghum	Yam	All covered
1961	0	-31	-76	-15	279	0	-18	70	238	0	23
1962	0	-30	-77	-17	310	0	-13	68	248	0	28
1963	0	-42	-77	-29	214	0	-35	51	176	0	16
1964	0	-38	-74	-23	234	0	-34	70	202	0	18
1965	0	-54	-74	-34	144	0	-43	49	201	0	15
1966	0	-36	-66	-29	249	0	-34	60	278	0	20
1967	0	-63	-73	-45	98	0	-42	-12	197	0	7
1968	0	-62	-53	-55	160	0	-10	4	215	0	13
1969	1	-65	-70	-65	182	0	-26	4	157	0	7
1970	0	-69	-78	-68	109	0	-57	33	165	0	-2
1971	1	-58	-78	-69	208	0	-51	103	194	0	10
1972	1	-39	-74	-59	287	1	-25	87	305	1	12
1973	1	-34	-73	-63	108	1	-47	-4	177	1	10
1974	1	-44	-77	-35	66	1	-42	-33	129	0	5
1975	1	-37	-56	-10	122	1	-8	8	149	1	11
1976	1	-39	-69	-10	256	1	20	103	203	1	16
1977	1	-64	-82	86	153	1	-58	7	171	1	-5
1978	1	-62	-75	-40	178	1	-27	-4	261	1	2
1979	3	-58	-77	30	122	2	-13	30	134	2	3
1980	4	2	-71	-51	199	3	1	27	113	3	9
1981	3	29	-66	-48	276	3	1	35	245	2	11
1982	4	-11	-68	42	341	4	-4	98	239	3	17
1983	4	-64	-91	-74	53	3	-62	15	31	2	-5
1984	1	-67	-68	-20	82	0	-63	71	129	0	7
1985	2	-72	-50	-5	127	2	-43	109	165	1	13
1986	1	-76	-78	-16	363	1	-19	29	95	1	20
1987	0	-33	-75	55	264	0	-27	129	348	0	27
1988	0	-26	-94	42	88	0	80	55	131	0	9
1989	1	44	-81	-47	59	1	-50	11	77	0	4
1990	1	18	-81	-56	92	1	-49	57	122	1	4
1991	0	15	-69	226	107	0	95	31	127	0	13
1992	0	-35	-91	-57	84	0	97	0	103	0	-2
1993	0	-40	-94	-78	37	0	-10	-18	54	0	-7
1994	-5	20	-78	-48	48	-5	405	-15	118	-5	13
1995	-5	46	-79	-63	56	-5	191	-17	73	-5	3
1996	-5	10	-85	-45	9	-5	27	-24	26	-5	-5
1997	-5	22	-81	-35	83	-5	7	3	104	-5	1
1998	-5	-31	-84	-37	226	-5	3	-3	112	-5	0
1999	-5	-34	-85	-37	271	-5	-22	21	132	-5	1
2000	-5	-37	-82	-53	189	-5	-24	14	164	-5	-3
2001	-3	-16	-81	-55	66	-4	-17	30	76	-4	-4
2002	-4	-14	-84	-59	58	-4	-13	12	63	-4	-6
2003	-5	-31	-85	-61	43	-5	-9	5	51	-5	-8
2004	-4	16	-79	-60	36	-4	0	-12	49	-4	-6

Appendix Table 2 (continued): Annual distortion estimates, Nigeria, 1961 to 2004
(b) Nominal and relative rates of assistance to all agricultural products, to exportable and import-competing agricultural industries, and relative to non-agricultural industries[a]
(percent)

	Total ag NRA				Ag tradables NRA				
	Covered products		Non-covered products	All products (incl NPS)	Export-ables	Import-competing	All	Non-ag tradables NRA	RRA
	Inputs	Outputs							
1961	0	23	20	22	-31	240	60	1	58
1962	0	28	21	26	-29	244	71	1	69
1963	0	16	14	15	-40	180	40	2	38
1964	0	18	17	17	-37	202	46	1	44
1965	0	15	13	14	-44	177	34	1	32
1966	0	20	19	20	-36	253	61	1	59
1967	0	7	5	6	-54	139	15	1	14
1968	0	13	9	12	-50	166	31	2	29
1969	1	6	1	5	-62	150	11	1	11
1970	0	-2	-7	-3	-70	144	-7	-1	-5
1971	0	10	0	7	-65	197	21	-2	23
1972	1	11	12	12	-51	263	40	-1	42
1973	1	9	3	8	-56	98	24	-1	26
1974	1	4	4	5	-44	60	16	-3	19
1975	1	10	11	11	-34	97	39	-2	42
1976	1	15	15	16	-38	171	60	-2	64
1977	1	-6	-8	-6	-65	57	-13	-5	-9
1978	1	1	-9	-3	-68	58	-6	-3	-3
1979	3	0	1	2	-52	55	16	-3	19
1980	4	5	7	9	-30	39	39	-4	45
1981	3	8	16	13	-13	77	78	-2	81
1982	4	13	23	18	-18	160	125	-2	130
1983	3	-8	-27	-16	-80	-2	-30	-3	-28
1984	1	6	-13	-2	-74	63	-3	-4	1
1985	2	11	-14	0	-77	96	4	-4	8
1986	1	19	-19	3	-80	124	11	-2	14
1987	0	27	9	19	-54	184	73	-1	74
1988	0	9	5	8	-31	39	25	-3	29
1989	1	3	3	3	-25	20	11	-2	13
1990	1	3	-4	1	-55	36	5	-1	6
1991	0	13	15	14	-11	91	57	-2	61
1992	0	-2	-5	-3	-39	-1	-7	-5	-3
1993	0	-7	-11	-8	-48	-16	-21	-12	-10
1994	0	13	16	14	33	88	70	-10	90
1995	0	3	2	3	-35	46	25	-10	38
1996	0	-5	-8	-6	-49	9	-9	-13	5
1997	0	1	-1	0	-43	43	15	-12	30
1998	0	0	6	2	4	30	23	-10	36
1999	0	1	4	2	27	17	21	-1	22
2000	0	-3	-10	-6	43	-28	-6	-1	-5
2001	1	-5	-10	-6	-53	10	-2	-1	-1
2002	1	-7	-7	-7	-14	-11	-7	0	-7
2003	0	-8	-11	-9	-31	-14	-16	0	-16
2004	1	-7	-8	-6	-36	-2	-6	0	-6

Appendix Table 2 (continued): Annual distortion estimates, Nigeria, 1961 to 2004
(c) Value shares of primary production of covered[b] and non-covered products, (percent)

	Cassava	Cocoa	Cotton	Groundnut	Maize	Millet	Palmoil	Rice	Sorghum	Yam	Non-covered
1961	18	4	4	7	2	10	5	1	7	15	27
1962	19	3	3	8	2	10	4	1	8	15	27
1963	17	4	3	8	3	9	4	1	7	17	28
1964	17	6	3	7	2	8	4	1	7	18	27
1965	15	3	3	11	3	10	6	1	8	12	28
1966	23	4	2	7	2	7	4	1	5	17	27
1967	15	6	3	7	2	10	4	2	7	14	29
1968	15	5	1	8	2	10	3	2	6	15	32
1969	8	7	3	8	3	9	3	1	7	15	36
1970	11	8	4	6	3	8	3	1	6	18	32
1971	14	5	1	6	2	8	2	1	5	22	33
1972	16	5	2	7	1	10	2	1	4	20	31
1973	10	4	2	4	2	14	2	2	6	19	34
1974	7	3	1	6	1	10	3	2	7	27	33
1975	14	5	2	2	3	9	3	2	5	25	32
1976	20	4	3	2	2	8	2	1	4	20	35
1977	18	6	5	1	1	5	4	1	3	18	37
1978	21	4	2	2	1	4	3	1	2	19	41
1979	22	6	2	1	1	5	5	2	4	23	29
1980	23	3	2	4	1	5	5	3	5	22	28
1981	37	1	1	2	1	4	2	2	2	20	28
1982	34	2	1	1	1	6	2	2	3	22	28
1983	19	2	1	3	1	4	2	2	4	11	48
1984	24	2	0	2	1	7	2	2	4	14	42
1985	23	2	0	1	2	6	2	1	3	11	48
1986	26	2	1	2	3	7	2	2	4	9	43
1987	28	2	1	1	2	7	2	2	2	10	42
1988	27	3	6	2	5	6	1	3	4	14	29
1989	20	2	2	3	4	5	2	4	3	12	43
1990	21	1	3	4	4	6	1	2	2	16	40
1991	31	1	3	1	4	5	1	3	3	21	28
1992	26	2	7	3	3	4	1	3	3	19	29
1993	24	2	4	5	4	4	3	3	4	18	30
1994	27	2	1	3	5	5	2	2	3	22	28
1995	23	1	1	3	3	5	2	2	3	24	33
1996	23	1	2	3	4	4	2	2	4	19	37
1997	26	1	1	3	2	5	2	2	3	20	34
1998	27	2	2	3	1	5	2	2	3	20	33
1999	26	1	2	3	1	5	2	2	2	21	34
2000	22	2	2	4	1	4	3	2	2	20	37
2001	26	2	2	4	2	5	4	1	3	23	28
2002	26	2	3	4	2	5	4	2	3	22	26
2003	26	3	3	4	2	5	4	2	4	21	25
2004	28	2	2	4	2	5	4	4	4	20	25

a. The Relative Rate of Assistance (RRA) is defined as $100*[(100+NRAag^t)/(100+NRAnonag^t)-1]$, where $NRAag^t$ and $NRAnonag^t$ are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively.
b. At farmgate undistorted prices, US$

Source: Author's spreadsheet