Distortions to Agricultural Incentives in Ghana

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Ghana's economic performance over the past 20 years can be described as a qualified success. Since 1986, real GDP has grown at an average of more than 4 percent per year, enabling per capita incomes to increase by a total of 30 percent between then and 2004. With rising incomes, there has been an associated decline in poverty: the incidence of food poverty has fallen from an estimated 37 percent of the population in 1991/92 to 27 percent in 1998/99 (Ghana Statistical Service 2000). This performance is much better than that recorded elsewhere in Sub-Saharan Africa, where per capita incomes have on average remained static and poverty reduction has been sparse. On the other hand, it has done little more than return Ghana's per capita income to the level at independence in 1957, and compares unfavourably with the faster pace of growth and poverty reduction in other regions, notably in Asia.

Nevertheless, the stable state of the economy, linked to more than a decade of democratic government, contrasts sharply with the situation in the early 1980s, when the economy lay in ruins. Stryker (1990), in his contribution to the study led by Kruger, Schiff and Valdés (1988, 1991), notes that agricultural distortions played a key role in the disintegration of the Ghanaian economy. That study, which examined the evolution of agricultural policies and their consequences from the pre-independence period to the mid-1980s, when liberalisation and structural adjustment were initiated, identifies the following sources of decline: chronic macroeconomic instability, increasing currency overvaluation, strict controls over the economy in general and the agricultural sector in particular, and ineffective state interventions. Mismanagement of the cocoa sector had a particularly damaging effect on Ghana's economic performance. At the political level, there was great instability, with regime changes leading to policy reversals, and rent seeking by vested interests to such an extent that by 1983 the economy had effectively devoured itself and there were no more rents left to extract.

This chapter aims to bring Stryker's analysis up to the 21st century. Since then, Ghana has followed IMF stabilisation and World Bank structural adjustment programs, and moved

into a "post-reform" phase where the effects of liberalising reforms are being digested and the benefits of further reforms are being queried. Over this period there have been numerous reviews of Ghana's economy, and several examinations of agricultural policies and performance, including periodic World Bank reviews (the latest in 2000). However, since Stryker's empirical analysis, which stops in 1985, there has been no comparable attempt to quantify agricultural policy distortions, assess their economic impacts, and put their importance in the context of Ghana's broader development challenges.

A general finding of the present analysis is that the profound policy distortions that characterized Ghana's agricultural sector until 1984 have been reduced substantially. The exchange rate, which now floats, is no longer consistently overvalued, and trade policies are relatively even in their treatment of different sectors, with relatively uniform tariffs and logical exemptions, for example for inputs and products conducive to improved health and education. Improved macroeconomic and political stability and greater transparency in the policy process have meant that the prospects for agricultural development are much enhanced. Nevertheless, specific distortions still afflict Ghana's agricultural sector. Import-competing sectors are protected by the standard tariff of 20 percent, while there is some implicit taxation of exports. In the case of cocoa, the marketing board's share of the export price has risen with increases in the world market price, dampening incentives to invest. However, the main distortions lie not in the realm of explicit sectoral policies but in the way in which underdevelopment of physical infrastructure, weak credit markets, and stalled structural reforms (including to the country's financial markets) hamper progress.

Government spending on agriculture remains low, at consistently less than 2 percent of all public spending. The 2004 share of just 1.3 percent contrasts with the target established in the Maputo Declaration of 2003, where African Heads of State and the Government committed themselves to increasing national expenditures on agriculture and rural development to 10 percent of all budgetary expenditures. There have been large increases in donor aid in recent years, with the net inflow of aid climbing from an average of 2.8 percent of GDP between 1996 and 2000 to 7.1 percent of GDP between 2001 and 2003, in part due to debt relief (Bank of Ghana 2005); but that aid has not been systematically targeted to agriculture.[1] As a complement to domestic spending, this injection provides real opportunities to remedy deficiencies in the functioning of both output and factor markets. The key challenge is to ensure that these monies are spent in suitable public investments, rather than in

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[1] The value of HIPC assistance was about half that of loans and grants in 2002-03.

measures that distort producers' incentives by leading them to invest in agricultural activities without a sustainable future or which use purchased inputs excessively.

With such reforms, agriculture can play its part in lifting Ghana's growth rate from levels that barely exceed population growth to the 6-8 percent target established in Ghana's revised Poverty Reduction Strategy (National Development Planning Commission 2005) that, it is estimated, would enable Ghana to achieve middle-income country status by 2015.

Economic growth and structural changes

Ghana's economic development can be divided into four broad phases: the pre-independence period to 1957, the post-independence period from 1957 to 1983, the years of stabilisation and adjustment between 1983 and 1992, and the post-reform period from the elections of 1992 onwards.

Pre-independence (up to 1957)

Agricultural policy prior to independence emphasised the production of export commodities (cocoa, coffee, oil palm, etc.) and paid little attention to non-commercial production or the development of staple food crops for domestic consumption. In general the emphasis of policy was on natural resource extraction, with minimal colonial oversight of other sectors of the economy.

Some of the subsequent apparatus of government intervention, notably marketing boards, were established during this period. A particularly important institution, the Cocoa Marketing Board (CMB), was established by the colonial government during the Second World War, and became the monopoly buyer of cocoa at a fixed price paid to producers. Until 1951, the majority of CMB profits were absorbed by the reserves of the board. In that year, however, taxes were raised and cocoa profits were diverted to general public investment.

Internal self-government was ceded to Ghana in 1951, and the country's first leader, Dr. Kwame Nkrumah attempted to foster rapid economic and social development by investing reserves that had accumulated during the Second World War and cocoa earnings that were boosted by the commodities boom induced by the Korean War.

Post-independence (1957-1983)

Ghana's economic performance after independence in 1957 was undermined by political instability, ideological splits and policy reversals.

At independence in 1957, Ghana had one of the highest per capita incomes in Africa, placing it on a par with middle-income countries by today's standards. The country was the world's largest producer of cocoa and had external reserves that were equal to three years' of imports. Cocoa prices began to decline significantly after 1957, yet the government continued to spend money on a large scale, even when revenues were lower, and from about 1961 onwards became more heavily involved in central planning, rather than limiting spending to public goods.

In 1961 the CMB was granted a monopoly on all purchases of cocoa from farmers in Ghana, replacing the existing network of private agents, traders, brokers and other middlemen. Despite falling cocoa prices, substantial increases in production as a result of new planting meant that Ghana's export revenues remained relatively constant. Since production and marketing costs increased with the expansion of output, profits were squeezed and government revenues declined. With rising imports for public investment, the current account deteriorated and foreign exchange reserves dwindled. In response, foreign exchange controls and import licensing were introduced. From 1961, public spending shifted away from the provision of public goods towards the development of large state-owned enterprises (SOEs) designed to substitute domestic production for imports.

When world cocoa prices collapsed in the second half of 1964, the only way the government could meet its expenses was by printing money. This fuelled inflation and lowered real wages, thereby undermining support for the Nkrumah regime.

Nkrumah's government was ousted by a military coup in February 1966. By this time, per capita GDP was not much higher than in 1951. After a brief adjustment of policies, government was handed over to the democratically elected Busia (1969-71). He too was ousted by the military, whose (corrupt) rule and continued mismanagement of the economy further depressed real incomes between 1972 and 1979. The deteriorating economic and political situation eventually led to a coup by junior members of the armed forces, led by Flight-Lieutenant Jerry J. Rawlings. A brief return to civilian rule (1979-81), marked by ineffectiveness and allegations of corruption, was ended by Rawlings' second coup and the establishment of the Provisional National Defence Council in 1981.

Rawlings' government embarked initially upon a course of populist policies but after two years it became apparent that these policies would not arrest the country's economic decline. In addition to the already serious economic and political situation, Ghana faced drought and bushfires in 1983 as well as the forced return of over 1 million Ghanaians from Nigeria.

The nadir was reached in 1983. At the root of this collapse lay unsustainable levels of government expenditure, an increasingly overvalued exchange rate, import licensing, inflation and price controls and heavy state involvement in the running of the economy (Tsikata 1999, Leith and Söderling 2000). For example, in 1984 about 2.5 percent of the population was employed in the Civil Service, one of the highest ratios in Africa at the time. Public enterprises and boards employed another 2 percent. Preliminary audits conducted in 1986 indicated that there were tens of thousands of 'ghost workers' on the public sector payroll (Alderman, Canagarajah and Younger 1993). Agricultural policy (discussed later) was fundamental to the dissolution of the Ghanaian economy. In particular, cocoa prices were falling, and the overvaluation of the cedi implied that the domestic currency equivalent of the f.o.b. price of cocoa was falling faster still, exacerbating the struggle between farmers and the government over cocoa revenue. This was further aggravated by the rising costs of the CMB and by the smuggling of cocoa to neighbouring countries where producer prices were much higher at the black market exchange rate (Stryker 1990). The result was a steadily deteriorating economic situation and widespread rent-seeking, which increasingly undermined Ghanaian institutions and society.

By the early 1980s Ghana had been surpassed by at least half the countries of sub-Saharan Africa in terms of per-capita GDP (Appendix Table 1). Government revenues fell from 15 percent of GDP in the early 1970s to 6 percent in 1982. Public sector wages fell by an average of 10 percent in real terms per year between 1975 and 1983. Export earnings fell to a low of 7 percent of GDP, and external financing dried up. Moreover, price controls led to much economic activity taking place in parallel markets, and to a general shortage of goods and services.

Reform and adjustment (1983-92)

The government responded by introducing a number of ad hoc programmes to deal with the emergencies and in April 1983, under the auspices of the IMF and the World Bank, initiated a program of economic stabilization and market reform, known as the Economic Recovery

Program (ERP). The reform strategy included a realignment of relative prices, the removal of direct controls and interventions, restored fiscal discipline, and the implementation of structural and institutional reforms. The ERP reinstated the necessary fundamentals for economic growth. In conjunction with increased inflows of external financing, real GDP rose by about 4 percent per year between 1983 and 1992.

Of central importance to the ERP was exchange rate policy. By 1982 the cedi was estimated to have been overvalued by 1000 percent (Leechor 1994). In April 1983, the government established a multiple exchange rate system, which was abolished in October of the same year. Following a series of devaluations, a public auction system was established in 1986 for most transactions not involving cocoa, petroleum and official debt service. In February 1987 the official and auction exchange rates were unified. Devaluation rapidly lowered the black market premium, and the introduction of foreign exchange auctions with a gradual move to a managed exchange rate virtually eliminated it by the 1990s.

The budget was balanced by 1986, thanks to stronger government revenues deriving from exchange rate and tax reforms. With improved fiscal discipline, monetary growth was also kept in check, as the government had lower financing needs. Inflation was thus brought under control, falling from 123 percent in 1983 to 10 percent in 1992. But it was difficult to sterilise inflows of foreign assistance, which became increasingly important from the mid-1980s onwards, and so inflation was not fully tamed. Moreover, fiscal and monetary discipline started to weaken in the run-up to elections in 1992.

SOEs were a major area for reform. In the mid-1980s more than half of value added and employment was reported to be in SOEs. But reform proved more complex for both practical and political reasons, and not until 1990 were any sell-offs actually made. Similarly, financial reforms involved an evaluation of non-performing loans and a deregulation of credit and interest rates. However, the reform of rural banks proved difficult.

Despite pursuing populist policies, the Rawlings government did not incur debt but, with the adoption of more orthodox economic management, foreign governments and multilateral agencies were increasingly eager to invest in Ghana. As a result, the ratio of debt to GDP increased from 41 percent at the outset of the ERP to 63 percent at the end of the decade, and 85 percent by the mid-1990s.

From 1992

When democratic elections were held in 1992, several politically sensitive and administratively complex reforms remained unfinished, and became subject to the vagaries of electoral competition. These included the reform of the cocoa sector, the divestiture of state-owned enterprises, and the establishment of effective tax collection and expenditure control systems for government (Leith and Söderling 2000).

With civilian rule, government expenditures continued to rise and public deficit mounted. A significant share of this deficit was financed by printing money, which led to a surge in CPI inflation. From 1994 onwards there was also significant borrowing from abroad (more than 3 percent of GDP). Accordingly, the ratio of total external debt to GDP spiralled from 88 percent in 1994-96 to 119 percent in 2000-02, although by 2004 it was down to 80 percent. Through the 1990s, debt service as a ratio of export earnings averaged 25-30 percent, which exceeds the 20-25 percent level that is deemed to be sustainable under the HIPC initiative. However, the ratio has dropped significantly since, and was down to 7 percent by 2004 (World Bank 2006a).

With a market-determined exchange rate, and a weakening fiscal position, the real exchange rate depreciated sharply (Table 1). This stimulated export growth, with the share of exports to GDP increasing to rates comparable to those in the 1960s before exchange controls started to bite from 1995. Yet the rapid depreciation of the real exchange rate had little dampening effect on imports, due to substantial financing of the government's budget by transfers from foreign donors, foreign borrowing and a surge in private remittances.

The government had difficulty in constraining the public deficit and, with limited domestic savings, the balance of payments deficit. VAT was introduced in 1986, only to be withdrawn shortly afterwards following protests. It was successfully reintroduced in 1998, but at a lower rate (10 percent compared with an original proposal of 17½ percent). The tax actually replaced a sales tax, but was on a broader base and was linked to improved record keeping and enhanced compliance. As a result, revenues ultimately increased. A constitutional amendment passed in 2002 has made it illegal for expenditures to exceed revenues by more than 10 percent.

A structural problem arose when support for SOEs was removed, as the private sector did not have the capacity to fill the gap, and many systems collapsed. This raises the question of whether phased government withdrawal, via public-private partnerships, may not have been more appropriate. In that context, the initially slow pace of privatisation may have been a blessing. The divestiture of SOEs gathered pace in the 1990s, and has been favourably reviewed (Ghana Divestiture Implementation Committee 1997).

Only in the last few years have the non-performing assets of the economy been tackled. In 1998, 23 of the 133 rural banks that were in operation had their licenses withdrawn (Leith and Söderling 2000). But human capital remains a problem for rural banking, with the result that management is still often poor and rural banks continue to accumulate bad debts.

Since 1992, there have been relatively minor modifications in trade policy. Ghana has a relatively simple tariff structure, comprising three rates: a low rate of 0 percent (with some items recently raised to 5 percent) reserved primarily for primary products, capital goods, and some basic consumer goods; a moderate rate of 10 percent applied primarily to other raw materials and intermediate inputs, as well as some consumer goods; and a higher rate of 20 percent, mainly on final consumer goods. In addition there are several programs under which imports can be exempted from import duties, and manufacturers can apply for permission to import raw materials and intermediate inputs at concessionary duty rates. Zero rated goods account for an estimated 13.5 percent of imports (Haizel et al. 2002). In addition, Ghana does not differentiate between imported and locally-produced commodities in its domestic indirect taxes, so there are no distortions in this area.

In 1999, Bajracharya and Flatters (1999) argued for more comprehensive tariff reforms, suggesting that additional revenues could be obtained by tightening exemptions, adjusting the tariff rate structure, and administrative reform. They concluded that the greatest potential for revenue improvement, as well as significantly enhanced trade facilitation, was most likely to be found in administrative reform of customs and related procedures, suggesting that revenue increases of 20 percent were possible (on a base which includes import-related excises and VAT as well as import duties). Inspection agencies charge a 1 percent fee for these services, and an ECOWAS customs duty of 0.5 percent is levied on imports from non-ECOWAS countries.

In a subsequent review undertaken for DFID (Haizel et al. 2002) it was similarly concluded that low tariffs could enable Ghana to abolish the duty drawback and would help ensure fairness, transparency, consistency and efficiency in customs administration. They also noted the need to improve port clearance and turnaround time, a point reinforced in a World Bank study (World Bank 2006b) which notes that it takes an average of 55 days for imported goods to clear customs and reach factory warehouses, and an average of 47 days for exports to leave the factory and clear the port of exit. This is much higher than the efficient benchmark (five days for exports and imports in Denmark), but also substantially higher than the recorded times in Côte d'Ivoire, Senegal, Togo and Nigeria.

In overall terms, the current policy environment in Ghana contrasts sharply with that prevailing up to 1983. Yet policy reforms have not been fully consolidated, nor have they been accompanied by the structural reforms needed to make them work. As a result there has been some reform fatigue, and, unfortunately, some questioning of the process itself, rather than the way in which it has been pursued.

Economic performance

Growth has held steady at about 4-5 percent per year (Appendix Figure 1). With population increasing at 2½ percent per year, this has translated into per capita income growth of 2-3 percent per year over the past 20 years.

With such growth rates it is estimated that it would take 30-40 years to eradicate absolute poverty in Ghana (Hadjimichael et al. 1996). Indeed, 20 years of 4-5 percent growth has done little more than bring per capita incomes back to the levels enjoyed nearly 50 years ago, when Ghana attained independence (Appendix Figure 2). Recent economic performance has been more robust, with real GDP growth reaching 5.8 percent in 2004, a percentage point above the average for 2001-03. Agriculture was the strongest component of overall growth, with particularly strong production growth in the cocoa sector (which has benefited from government sponsored disease control programs).

Inflation rebounded in the 1990s, reaching 60 percent in 1995 and 25 percent in 2000 as the government failed to contain budget deficits (Appendix Figure 3). The government's overall fiscal deficit worsened to 8.2 percent of GDP in 2000, and the current account deficit deteriorated to 10.6 percent of GDP. The real effective exchange rate reached a corresponding low in 2000 and has remained relatively stable since then. A particular problem has been fiscal profligacy in election years, and government responsiveness to special interest groups, such as doctors, Cocoa Board members, railway employees and civil servants (Leite et al. 1999). The failure to consolidate macroeconomic stability has undermined investment and, with it, the country's long term growth.

Ghana's trade performance has improved considerably since the mid-1980s. In response to lower taxation and fewer controls, exports grew at an average of 10 percent per year between 1984 and 1994, while imports grew at a similar pace. This enabled the share of exports in GDP to recover from an average of 6 percent in 1981-85 to more than 20 percent in the 1990s and over 40 percent between 2001 and 2004 (Table 1).

Following reform, the strongest performing sectors were mining, utilities, construction and most services, in particular transport and the wholesale/retail sector. Manufacturing grew rapidly in the 1984-86 period but its rate of growth has since fallen below the economy's overall rate. More recently, non-traditional exports – mainly processed and semi-processed goods – have become increasingly important. Exports of non-traditional goods (both agricultural and non-agricultural) increased from US$24 million in 1986 to $402 million in 1998, and $636 million in 2005, their share of total exports growing from about 5 percent to more than 25 percent over this period.

Reforms have been complemented by increased aid flows and migrant remittances. Total aid flows jumped significantly between 1989 and 1992 as donors aimed to support institution building activities in the run-up to the multi-party elections set for 1992 (Tsikata 1999). More recently they have climbed again, as part of a concerted effort to accelerate growth in Sub-Saharan Africa (Appendix Figure 4). Private remittances exceed the combined total of official transfers, official capital and private capital flows, amounting to $1.3 billion, or 15 percent of GDP in 2004 (IMF 2005), and reportedly exceeding $3 billion in 2005.

Ghana's varied economic fortunes have been reflected in the performance and relative importance of the agricultural sector. As the economy collapsed, agriculture assumed an important buffer role, its share of GDP rising to 60 percent in the early 1980s. Since then, agriculture's relative importance has declined, conforming to the general pattern whereby economic development is accompanied by a shift of resources to non-agricultural activities. Yet at one-third of national income, agriculture is still almost as important as it was 40 years previously (Appendix Figure 5). Agricultural growth was, equivalently, slower than growth in other sectors, partly reflecting the aforementioned shift of resources between sectors, and partly as a consequence of lower commodity prices. Since 2001, agricultural growth has on average matched the overall growth rate of 5 percent, as commodity prices have recovered.

Poverty

On the basis of the Ghana Living Standards Survey (GLSS) data, and a food poverty line set at the estimated annual expenditure per person required to meet minimum nutritional requirements, the poverty incidence in Ghana fell from 37 percent in 1991/92 to 27 percent in 1998/99. Given the rise in the population numbers, this means a drop from 5.8 to 5.0 million people faced with food-poverty. Christiaensen, Demery and Paternostro (2002) report consumption poverty indices for 1992 and 1998 of 51 and 39 percent respectively, based on

the food intake required to meet a minimum caloric intake with adjustments for essential non-food consumption.

There are large rural and regional differences in poverty levels and their changes. Poverty has fallen steeply in Greater Accra and other regions but has increased in the Central, Northern and Upper East regions (Appendix Table 2). At the national level, the reduction in poverty was almost entirely due to economic growth. The overall redistribution effect was negligible, although it played an important role in the Accra region where reduced inequality helped reduce poverty significantly (IMF 2000). Worsening inequality elsewhere, especially in the urban coastal region, offset this positive development.

The ERP and the resulting economic growth led to significant improvements for households engaged in export farming and for those in formal employment, in both the public and private sectors. Households in the food crop farming sector continued to perform worst, with the incidence of food poverty falling from about 52 to 45 percent for this group over the 1991/92 to 1998/99 period (Appendix Table 3). By 1998/99, households in the food crop farming sector accounted for 65 percent of national poverty, up from 62 percent in 1991/92. These developments reflect the fact that the ERP benefited primarily export-oriented farmers. Outside the export sector agriculture grew sluggishly and, with weaker income growth and fewer non-farm income-earning opportunities, this negatively impacted on the welfare of food crop farmers.

In the northern parts of the country (Northern and Upper Regions), where most farmers are dependent on food crop farming, poverty worsened as a result of lower agricultural and off-farm earnings.

Agricultural policies in Ghana

Agricultural policies in Ghana have formed an important part of the general setting of policy, and shifts in sectoral policy have generally matched reorientations in overall policy. In particular, policy towards the cocoa sector has gone through dramatic changes, which have had a hugely important impact on Ghana's collapse and subsequent recovery.

Ghana's agricultural policies prior to 1983 are thoroughly described by Stryker (1990, 1991). They included price controls, input and credit subsidies, obligatory credit allocations, and heavy state involvement in production, distribution and marketing. As with economic

policy in general, 1983 saw a completely new approach to agricultural policies. The government privatised state farms, removed price controls and gradually reduced subsidies on inputs such as fertilizer. In 1990 the government removed the guaranteed minimum price paid to farmers for selected food crops (mainly maize and rice) and in 1992 abolished input subsidies altogether.

Prior to reforms, procurement was facilitated through the Agricultural Development Board, which was set up in the 1960s, and was responsible for buying maize and rice at guaranteed prices and storing them in an effort to stabilise prices. This organization was superseded by the Ghana Food Distribution Corporation (GFDC), which was established in 1975 and dissolved in 1987. On average the GFDC bought less than 5 percent of the maize and rice produced in the country, its effectiveness constrained by a lack of storage facilities and weak infrastructure (Puplampu 1999).

In 1986-88 the government drafted a new agricultural policy: the 'Ghana Agricultural Policy: Action Plan and Strategies 1986-88.' Key objectives outlined in this initiative were: self-sufficiency in cereals, starchy staples and animal protein food, with priority for maize, rice and cassava in the short term; maintenance of adequate buffer stocks for price stabilization and food security during shortfalls; and improving institutional facilities such as research, credit and marketing. However, putting these objectives into practice proved difficult, in part due to the weak institutional capacity of the country.

The GOG, in collaboration with the World Bank, consequently embarked on the 'Agricultural Services Rehabilitation Project (ASRP)' over the 1987-1990 period. The main objectives of the project were to strengthen the institutional framework for formulating and implementing agricultural policies and programmes, improve the delivery of public sector services, and improve the procurement and distribution of agricultural inputs by way of privatisation.

The ASRP project did succeed in strengthening the capacity of agricultural research, extension, irrigation and policy planning institutions. To build on these short-term improvements, the government, with support from the World Bank, decided to implement a more strongly resourced medium-term program, focusing on the key areas of agricultural research, extension, livestock, fisheries development and export promotion. The 'Medium Term Agricultural Development Program (MTADP)' covered the 1991-2000 period and was broadly aimed at increasing productivity and competitiveness in the agricultural sector. A number of stand-alone projects were launched under MTADP such as the 'National

Agricultural Research Program' (NARP), the 'National Agricultural Extension Program' (NAEP), and the 'Fisheries Capacity Building Project' (FSCBP).

Despite the increased attention given to agriculture, growth in the sector remained relatively sluggish throughout the 1980s and also in the first half of the 1990s. The much improved performance in the second half of the 1990s was largely a result of the improved macroeconomic environment. Structural weaknesses – inadequate roads, poor access to markets, inappropriate agricultural practices, low technology, etc. – were and (despite some improvements) remain key constraints to growth.

In 2003, MOFA developed a 'Food and Agriculture Sector Development Policy' (FASDEP). The objectives of this programme include food security, poverty reduction, supplying raw materials to industry and ensuring the sector's continued contribution to GDP, foreign exchange and government revenue. Reflecting the market orientation of government policies more generally, the private sector is seen to be the main engine that will deliver on these objectives. The main break with the past is FASDEP's focus on a sector-wide approach to agricultural development, contrasting with the discrete project approach pursued in the past. FASDEP is expected to contribute to Ghana's Poverty Reduction Strategy (GPRS) via infrastructure development, the promotion of appropriate technologies, and improved extension services.

However, a Poverty and Social Impact Assessment (PSIA) of the strategic objectives for agricultural policy criticised FASDEP as a one-size-fits-all policy that does not take account of the diverse needs of different stakeholders in the agricultural sector, notably the very poor and women. Accordingly, a broader revision of FASDEP is underway. This involves spelling out more clearly what a sector-wide approach entails, providing guidance for a six-year policy plan, and achieving consensus among stakeholders (including donors) with a view to implementing a new sector-wide policy by 2008.

Cocoa policy

The government's policy towards cocoa, the country's biggest export earner, has been a major component of its overall economic policy, and has changed along with the general orientation of economic policy over time.

Ghana became the world's leading producer of cocoa by 1911 (a position it retained until the mid-1970s), and by 1920/21 produced 32 percent of world cocoa output. Production has always been small-farm based (there are about 1.6 million smallholder farmers growing

cocoa, mostly on plots of 3 hectares or less) with plantations never having been of much importance. Until the Second World War internal and external marketing were handled by private firms, but during the war the colonial government took over the purchase of cocoa, selling it to the British Food Ministry (Leith and Söderling 2000). In 1947 the Cocoa Marketing Board (CMB) was established, with a monopoly over internal and external marketing. The influence of the CMB in the cocoa industry (after 1979 called The Ghana Cocoa Board or COCOBOD) was pervasive and covered extension services, input marketing, and the maintenance and rehabilitation of roads in cocoa-producing villages.

While initially set up to protect farmers from price volatility, the CMB gradually turned into an instrument of public taxation (Stryker 1990). Rents were extracted by keeping producer prices well below the world price, and by using an over-valued exchange rate to make payments to farmers. Inefficiency, corruption, the increasingly poor state of roads and the shortage of spare parts meant that costs accounted for an increasingly large proportion of the f.o.b. price. In 1981/82 the black market exchange rate was 44 times the official rate and CMB costs exclusive of the price paid to producers exceeded the f.o.b. sales at the official exchange rate. Even after the cedi/US dollar exchange rate was devalued from 2.75 to 90 in 1985-86, CMB costs still accounted for 28 percent of the total value of sales (Stryker 1990).

Between 1967 and 1977, the system for purchasing and marketing cocoa gradually broke down as the economic situation deteriorated. By 1981/82 the amount of unshipped cocoa was about one-half of that harvested. Smuggling had also become increasingly attractive, with an estimated 20 percent of the crop being smuggled out of the country in the late 1970s and early 1980s. Output had stagnated following independence, but started falling from the early 1970s onwards. Falling world cocoa prices from the late 1970s, ageing trees, widespread disease and poor weather (bush fires in 1983 destroyed some 60,000 hectares under cocoa) also contributed to the decline.[2]

Production dropped from an average of 450,000 tons to a low of 159,000 tons in the 1983-84 growing season, when the crop was just 28 percent of the peak 1964-65 crop. Ghana's share of the world market fell accordingly, from 36 percent in 1965 to 17 percent in the early 1980s. It is worth noting that, as a result of strengthening world prices, export revenues remained steady initially – a factor which helped successive governments avoid painful reforms. The key sources of decline over the longer term were the overvalued

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[2] In 1983/84 farmers were provided with seedlings to replace trees lost in the drought and trees more than 30 years old (about one quarter of all trees).

exchange rate and high taxation, effected by means of a monopsonistic marketing board (Teal and Vigneri 2004). By 1983, cocoa farmers received only 21 percent of the f.o.b. price.

The mid-1980s saw the implementation of the Economic Recovery Programme, with agricultural policy focused on improving the terms-of-trade for cocoa. Producer prices rose in part because the government raised the farmer's share in cocoa earnings to 40 percent by 1994/95 and 50 percent by 2000/01 (ADB 2002). In addition, falling inflation helped boost real producer prices. By 1987/88 real producer prices had increased threefold from their low of 1983/84. Producer prices were also strengthened by squeezing COCOBOD's share in cocoa revenues from 30 percent to 15 percent of the f.o.b. price. While the share of the producer price in the world price has fluctuated in recent years, the real producer price has increased steadily, helping to raise COCOBOD purchases and exports (Figure 1).

Efforts to improve the efficiency of COCOBOD led to wide-ranging changes to its structure and activities. Transport of cocoa shifted to the private sector after 1984, while responsibility for cocoa feeder roads shifted to the Department of Feeder Roads, Ministry of Roads and Highways. A Cocoa Rehabilitation Project was initiated in 1987 with donor funding (ADB 2002). From 1988/89 COCOBOD began phasing out input subsidies and, over a relatively short period of time, this led to a substantial increase in input prices. However, following pressure from farmer organizations, the government reduced the price of insecticides and fungicides in 1994.

It was not until after the 1992 elections that reform of COCOBOD gained momentum. Major changes introduced were a reduction in staff levels from over 100,000 in the early 1980s to 10,400 in 1995 and just over 5,100 staff by 2003, an end to input marketing, and the introduction of competition into internal marketing. Licensed Buying Companies (LBCs) were set up to compete with the Produce Buying Company (PBC). By 1995/96 the PBC's share of purchases had declined to 80 percent and by 2000/01 to 37 percent. Monopsonistic price setting by COCOBOD remains in place.[3] Liberalization of COCOBOD's export monopoly started in 2000/01 and LBCs can now export 30 percent of their cocoa purchases directly to external buyers. However, a minimum tonnage requirement has meant that only 9 LBCs qualified and none actually marketed externally.

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[3] Cocoa producer prices (and related rates and fees in cocoa purchasing and marketing) are fixed by the Producer Price Review Committee (PPRC) made up of representatives of the cocoa farmers, licensed cocoa buyers, cocoa haulers, the Ministry of Finance (the Minister of Finance is the chairman of the PPRC), the Bank of Ghana, the Institute of Statistical, Social and Economic Research of the University of Legon, and COCOBOD officials.

The reforms have had an impact. In 2004, the cocoa sector accounted for 7.8 percent of GDP and contributed 21 percent of exports. Strong growth in the cocoa sector has been primarily due to government assistance and favourable weather conditions. The former includes free mass spraying of cocoa farms, which has reduced the incidence of pests and diseases, especially black pod, swollen shoot disease and capsid insect attack; a steady increase in the farmer's share of the export price; rehabilitation and replanting of old farms with new varieties; and road rehabilitation work in cocoa growing areas, which facilitated transport and reduced costs (USDA 2005, ISSER 2005). The public dissemination of higher-productivity, faster-maturing tree varieties played an especially important role in helping farmers respond to the new policy environment (Edwin and Masters 2005).

The growth of Ghanaian cocoa exports also reflects the influx of cocoa smuggled from Côte d'Ivoire, partly as a result of that country's civil conflict. The inflow is estimated to have been between 120,000 to 150,000 metric tons in 2003/04. However, cocoa from Côte d'Ivoire is of inferior quality and the smuggling may have contributed to a fall in the premium that Ghanaian cocoa receives – typically between $50 and $80 per ton – to about $20 per ton. Maintaining quality is the responsibility of the COCOBOD's Quality Control Division which carries out inspection, grading and sealing of cocoa for the international and local markets.

Of increasing economic importance are exports of processed cocoa products, in particular cocoa butter, liquor, powder and cocoa cake. In 2004/05 Ghana had a processing capacity of 145,000 metric tons, and export earnings from these products tripled between 1992-94 and 2002-04 from $32 million (about the level achieved in the early 1970s) to $102 million (FAOSTAT).

The GOG's policy with regard to producer prices is to reach a level of 70 percent of the world price. Price distortions persist partly because producer prices are not allowed to adjust quickly in response to upward movements in world prices. Cocoa supply is expected to increase gradually, especially if price incentives are coupled with improved husbandry techniques, pest control and adequate transportation infrastructure. The LBC's ability to generate competition has yet to be determined. Seini (2002) reports that these companies rarely pay more than the government producer price. Moreover, their role in the export market is limited by their inability to operate beyond a minimum scale. However, support for full liberalization of the sector is also limited by concerns over quality – an issue in which both producers and buyers have a stake.

Measuring distortions to agricultural incentives

It is clear from the above discussion that government policies have had a strong impact on the price incentives facing producers in Ghana. This section assesses the extent of those price distortions over the past half century. Our focus is on government-imposed distortions that create a gap between actual domestic prices and what those prices would be under free markets (Anderson et al. 2008). 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 facing non-agricultural producers for comparative evaluation. More specifically, this study computes a Nominal Rate of Assistance (NRA) for farmers. It also generates an NRA for nonagricultural tradables, which can be compared with the rate for agricultural tradables via the calculation of a Relative Rate of Assistance (RRA).

Price distortions are measured for four tradable crops: cocoa, rice, maize and groundnuts. In addition, the presence or absence of support for three non-traded or lightly traded staples (cassava, yams and plantains) is assessed as well. Collectively, these seven crops account for more than 70 percent of the value of agricultural production in Ghana (Figure 2).[4]

The commodities are diverse in terms of their net trade position. Cocoa is Ghana's main agricultural export; rice is the main imported food commodity; maize has traditionally been imported but there has been an exportable surplus in some recent years; and groundnuts were for many years not traded internationally but became a significant export in the 1990s. Cocoa, rice and maize were included in Stryker's analysis, which considered the period up to 1985, and found evidence of extensive distortions in all three sectors.

In the case of cocoa, the sector was heavily mismanaged, and only a minor share of the export price was returned to the producer (Appendix Figure 6(a)). There was some reduction

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[4] For rice and maize, international reference prices are converted into local currency at the black market exchange rate, on the assumption that importers must obtain hard currency at that price. Note that maize has been exported in some recent years, but by then the official and black market exchange rates had converged. Conversely, producers of cocoa beans and groundnuts are assumed to have been obliged to convert their foreign currency earnings into cedis at the official exchange rate but implicitly allowed to sell half their foreign currency earnings on the parallel market. In order to measure the extent of exchange rate distortions, and to gauge the sensitivity of the NRAs to the particular choice of exchange rate, all NRAs are computed at an estimated equilibrium exchange rate corresponding to a weighted average of the official and black market rates (see Anderson and Martin for a discussion).

in COCOBOD's share of export earnings in the 1990s, but as cocoa prices have strengthened in recent years that share has risen again. Export tax payments made by COCOBOD to the government declined from an average of 40-50 percent of FOB earnings during the mid-1990s to less than 10 percent by 2004. This has further allowed COCOBOD to increase its retained share of the export price, with the result that there has been a much milder reduction in the implicit taxation of the Ghanaian producer (Appendix Figure 6(b) and 6(c)).

Prior to the mid-1980s, rice producers received less than the imported price (at the farm-gate) suggesting some implicit taxation, while maize producers' prices were at a similar level to imported prices (again compared at the farm-gate) (Appendix Figure 7(a) and 8(a)). In both cases, domestic prices increased sharply in the mid-1980s, but the degree of price protection to producers has since diminished to levels somewhat higher than the statutory import tariff of 20 percent (Appendix Figure 7(b) and 8(b)). The evidence for rice and maize thus points to significant protection of import-competing commodities. In the case of groundnuts, producers have received slightly less than the export f.o.b. price in recent years, as the product has become a significant export (Appendix Figure 8). There is no evidence of direct policy interventions in the markets for staples such as cassava, yams and plantains.

These observations are reflected in Table 2, which shows NRAs for the four tradable crops computed at an estimated "equilibrium" exchange rate. Protection for import-competing crops (rice and maize) declined in the second half of the 1990s but has re-emerged in recent years.[5] Dis-protection (i.e. taxation) of exports of cocoa beans declined steadily until the latter 1980s. Further reforms through the 1990s lowered the rate of implicit export taxation to less than 20 percent.

Figure 3 shows that history back to 1955 but grouping products according to their net trade status.[6] Importable crops were effectively taxed prior to the economic collapse of the early 1980s. From the period of adjustment until the 1992 elections, significant protection was provided, with the NRA averaging over 60 percent. This protection was mostly dismantled in the 1990s, but those reforms have not been secured. Exports of cocoa beans were heavily taxed in the years between independence and the crisis that precipitated reforms and adjustment (1958 to 1982). The tendency to tax exportables has diminished over time, but remains significant, with an NRA averaging close to -20 percent in the period 1995-2004. When non-tradables are factored in, the overall pattern is one of very low net taxation of

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[5] Maize was exported between 1996 and 1999. Given the absence of export subsidies, import protection was therefore redundant in these years.

[6] Data for 1983 are dropped from the analysis. In this year the economy and trade collapsed, and domestic and international price comparisons are not reliable.

agriculture prior to independence in 1957, heavy net taxation in the post-independence period, and an overall balance declining to almost zero in recent years. This net balance masks a consistent tendency to tax exports and protect imports.

For much of the post-independence period, exchange rate distortions have had an important impact on producers' incentives. Based on the assumed equilibrium exchange rate, the cedi was overvalued by 13 percent between 1958 and 1982, with the degree of overvaluation falling to 8 percent between 1984 and 1992. This taxed producers of exportables, and increased the degree of price protection provided to import-competing products. In the case of cocoa beans, exchange rate overvaluation accounts for a significant share of implicit taxation prior to 1992. For import-competing products, the net taxation prior to the crisis would have been more severe but for overvaluation, while some of the high protection provided between 1984 and 1992 is explained by overvaluation. From 1992 onwards, the foreign exchange market functioned freely, so the NRA estimates reflect direct sector-specific distortions.

Continued protection of non-agricultural sectors has reinforced the discrimination against exportables throughout the period analysed and provided disincentives for producers of non-tradables. Non-agricultural protection also added to the bias against import-competing products in the period prior to the crisis when they were effectively taxed, and dampened the degree of protection provided in subsequent years. These impacts are reflected in the differences between the NRAs and RRAs (Table 3) and are illustrated in Figure 4.

The final rows of Table 3 show what the key indicators would be had exchange rate distortions not been taken into account. Those numbers reinforce the point made above that the exchange rate distortions contributed very significantly to agriculture's overall negative NRA, and to the negative RRA from the 1960s to the 1980s.

Market deficiencies affecting the agricultural sector

Ghana's agricultural sector also suffers heavily from implicit distortions in the form of market underdevelopment. In particular, transport costs are high (prohibitively so for many small scale farmers with a potential surplus to sell), while credit is expensive, with formal interest rates of 25 percent or more, and effectively unavailable for most producers without established links to international markets. Moreover, there are few signs of improvement in Ghana's social infrastructure and in the development of human capital. Less than 18 percent

of the country's roads are paved and their condition has deteriorated over recent years (World Bank 2006a), while the country's railway network is almost non-functional (OECD 2003).

One positive development for farmers is the advent of mobile phone use, with usage increasing from 6.6 users per 1000 population in 2000 to 78.2 per thousand in 2004. Health and education show few signs of improvement. Public health expenditures declined from 1.9 percent of GDP in 2000 to 1.4 percent in 2003 (World Bank 2006a). There have been improvements in male and female literacy in the past 25 years, but the rate of improvement has stalled and there are concerns about the quality of both primary and secondary education, and the particularly low rate of primary school enrolment in northern rural areas.

The determinants of policy changes

Prior to the adoption of liberalizing reforms in 1983, any attempts by the government to influence farmers' incentives through price policy were ineffective, as they could not offset the huge distortions deriving from the conjunction of high inflation and a fixed exchange rate. Accordingly the government tried to influence the allocation of resources through import licensing, exchange controls, marketing board operations, input distribution and the direct allocation of credit. It also pursued agricultural development through specific projects and public investments. This policy environment created enormous scope for arbitrage between informal markets and formal, government controlled channels, and led to rent-seeking on a massive scale. A strong bias developed in favor of large farmers with contacts and influence. As Stryker puts it: "government regulations were subverted, graft and corruption were rampant, and patron-client relations became entrenched as the principal means by which most people could gain access to scarce goods and services" (Stryker 1991, p. 116). It also subverted political representation and activity as a means of receiving favorable policy treatment.

Rawlings came to power as a populist leader dedicated to cleaning up government, but his attempts to reduce rent-seeking were counterproductive, as they did not deal with the fundamental problem of distorted incentives. However, once a decision was made to liberalize the economy and reduce price distortions, the incentives for rent-seeking diminished.

From 1983 onwards, the imperative was to resurrect the Ghanaian economy, and the government signed up to IMF and World Bank-led programs. The international financial

institutions thus played a key role in policy setting through the remainder of the 1980s, via the ERP and subsequent structural adjustment program. National lenders, as joint underwriters of reform, also had significant input.

As ODA increased in the run-up to national elections in 1992, the influence of national lenders increased. While lenders and donors broadly supported the macroeconomic tenets of reform and adjustment, they had a specific interest in ensuring that money was spent on worthwhile projects and public investments. This meant additional focus on the microeconomics of development policies, as well as macroeconomic distortions and price incentives. This reorientation coincided with a refinement of orthodox policy thinking in the 1990s, with undistorted price signals seen as a necessary but by no means sufficient pre-requisite for economic development. Outside the IFIs, a number of lenders and NGOs started to argue for a fresh look at infant industry arguments for agricultural protection in developing countries.

Until recently, agriculture was neglected by donors. And while there is a formal recognition of the need to devote more resources to agricultural development, this has not so far been reflected in the ODA statistics.

By contrast, the WTO has had little direct impact on trade policy formulation in Ghana. As a signatory to the GATT, Ghana was a founding member of the WTO, and acceded with "least developed country" status. Accordingly, it established ceiling bindings of 99.5 percent on agricultural tariffs. Moreover, Ghana's highest applied rate now stands at 20 percent, meaning that there is currently scope to increase tariffs.

In general terms, while policies in Ghana are far from being fully liberalized, it is more than 20 years since the most profound policy distortions were removed. Since then, Ghana's economy has recovered, but the pace of growth – and associated poverty reduction – has been disappointing compared with the experience of other developing countries outside Africa. Under such circumstances there are two alternative views, which reflect a controversy about the policies needed to stimulate growth in Africa more generally: one that liberalizing reform needs to be pushed through all the way, but accompanied by more effective policies to facilitate adjustment and improve competitiveness; the other that the process of liberalization itself should be addressed selectively and with circumspection. While the experience of massive intervention left such policies totally discredited, there is a divergence of views, both within Ghana and among donors, on the direction that policy should now take.

In agriculture, the experience with FASDEP, GPRS, and their associated review mechanisms illustrates the difficulty of achieving consensus among stakeholders when few of

those stakeholders hold to ideological certainties. One important issue is that agriculture is affected by policies in other sectors, where reforms have also lost momentum. In particular, further reforms to financial markets could help increase the flow of credit into the farm sector.

Prospects and policy options

Ghana's major current challenge is to choose appropriate investments that can raise productivity and raise growth from the 4-5 percent of the last 20 years to the 6-8 percent target set out in the GPRS. In the 50 years since independence, Ghana's growth has been circumscribed by currency overvaluation, excessive state interventions, excess demand (and repeated painful adjustments), discrimination against sectors in which the country holds a comparative advantage (notably cocoa), and suppression of the financial sector. Of these problems, the first two – heavily emphasised in Stryker's examination of Ghana's trade, exchange rate and agricultural policies through to the mid-1980s – have essentially been dealt with. Progress on the latter three has been positive but more fitful. In short, Ghana has not fully addressed the policy deficiencies that have constrained growth for half a century. On the other hand, the transition to a stable democracy has made policy-making a more transparent and consistent process, itself a major accomplishment.

The present study shows that policy biases have been reduced, but not eliminated: import-competing producers continue to receive significant protection, and COCOBOD continues to extract significant rents from farmers. However, there appears to be little appetite for fully eliminating distortions, due to concerns about the ability of farmers to compete, and about the implications of further tariff reductions for government revenue. Greater emphasis is, arguably with good reason, attached to boosting investments that can address structural weaknesses and thereby improve competitiveness and reduce poverty.

A difficulty with this approach – and one identified in the Poverty and Social Impact Assessment of FASDEP – is that policies which improve competitiveness generally may not be pro-poor, either because they are geared towards the most viable farmers, or because they intensify competitive pressures and the gap between modern commercial producers and traditional farmers. Thus, current policy debate, as in many other African countries, revolves around how to reconcile structural adjustment with poverty reduction.

There are some broad principles that should be able to guide policy design in Ghana. First, there is a need to address the structural weaknesses that impede development. These include a weak manufacturing sector, including in agriculture-related industries such as food processing, and a lack of outward orientation in potential export sectors. These weaknesses derive in part from deficient investment in public goods, such as transport systems and education and training, and from market failures that are inherently correctable (for example in the financial sector). Agriculture is also plagued by specific structural problems, including small and fragmented agricultural land holdings, weak farm level organization (notably a lack of grassroots institutions), unsuitable technologies, and a dearth of agricultural lending. These are key areas where government intervention, specifically to correct market failures, could be of benefit. The importance of, indeed the relevance of, eliminating Ghana's outstanding policy distortions needs to been seen in the context of these broader strategic needs.

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Figure 1: Cocoa production and producer prices, Ghana, 1964/5 to 2002/3
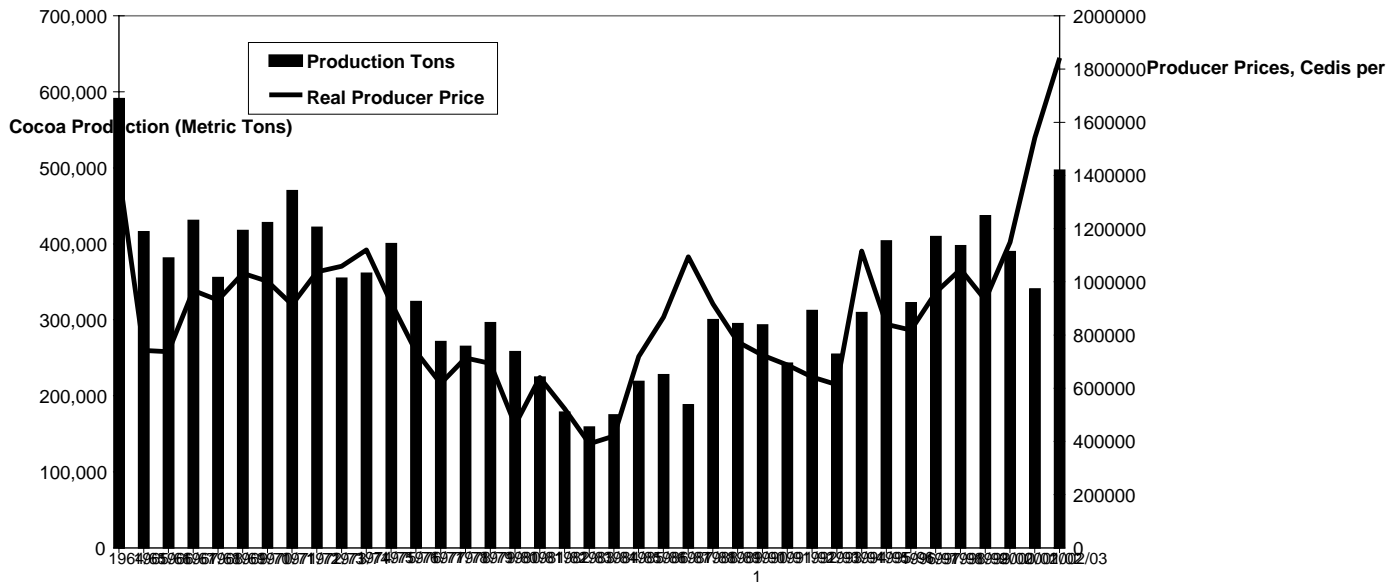
Source: Ghana Cocoa Board (www.cocobod.gh)

Figure 2: Product composition of agricultural production, Ghana, 1966 to 2003

(percent at distorted domestic prices)
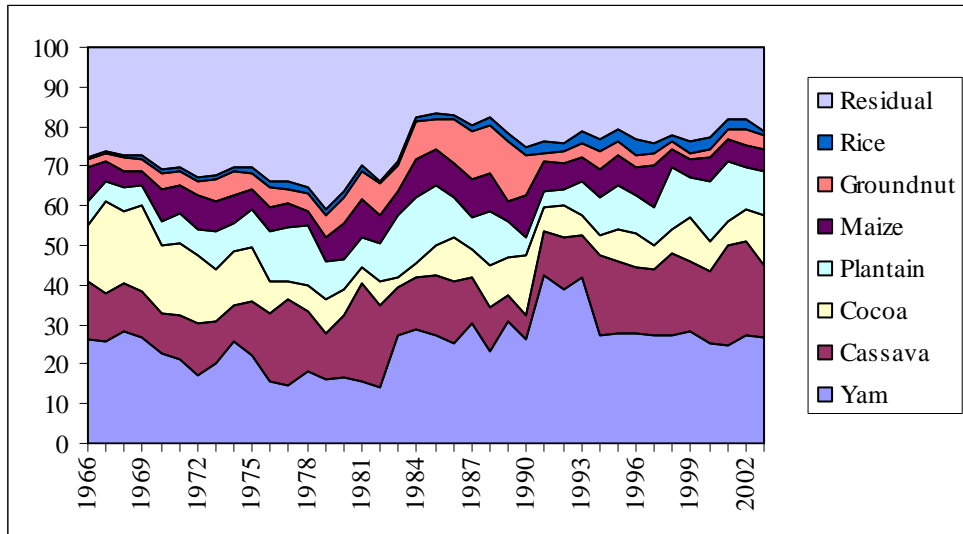
Source: Author's calculations based on FAOSTAT producer price and quantity data

Figure 3: Nominal rates of assistance to exportables, import-competing and all[a] agricultural products, Ghana, 1955 to 2004

(percent)
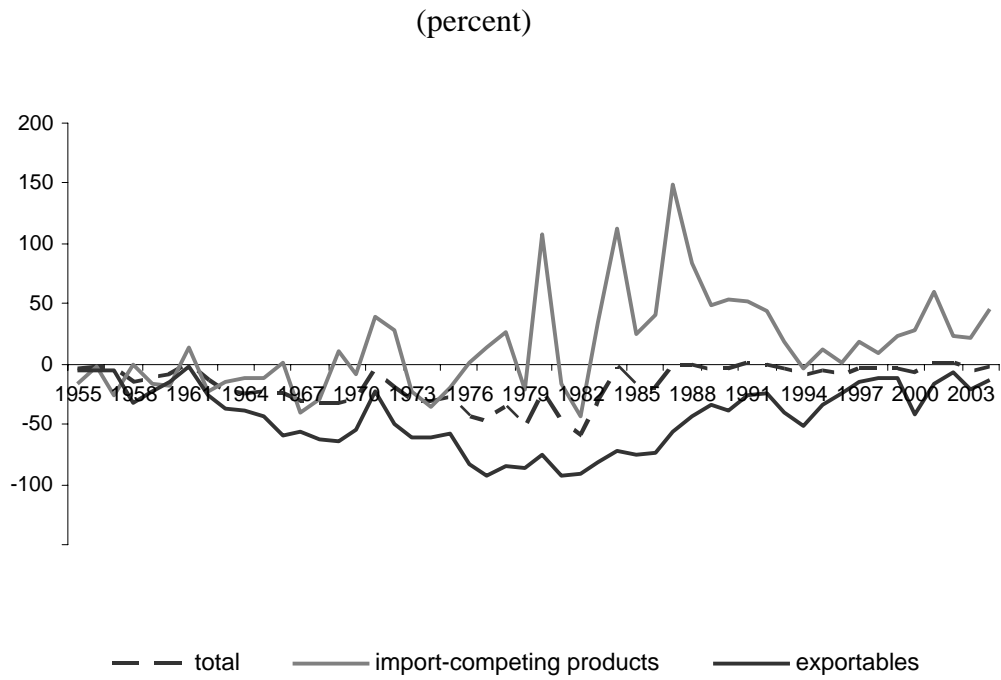
Source: Authors' spreadsheet
a. The total NRA can be above or below the exportable and import-competing averages because assistance to nontradables and non-product specific assistance is also included.

Figure 4: Nominal rates of assistance to all nonagricultural tradables, all agricultural tradable industries, and relative rates of assistance[a], Ghana, 1955 to 2004
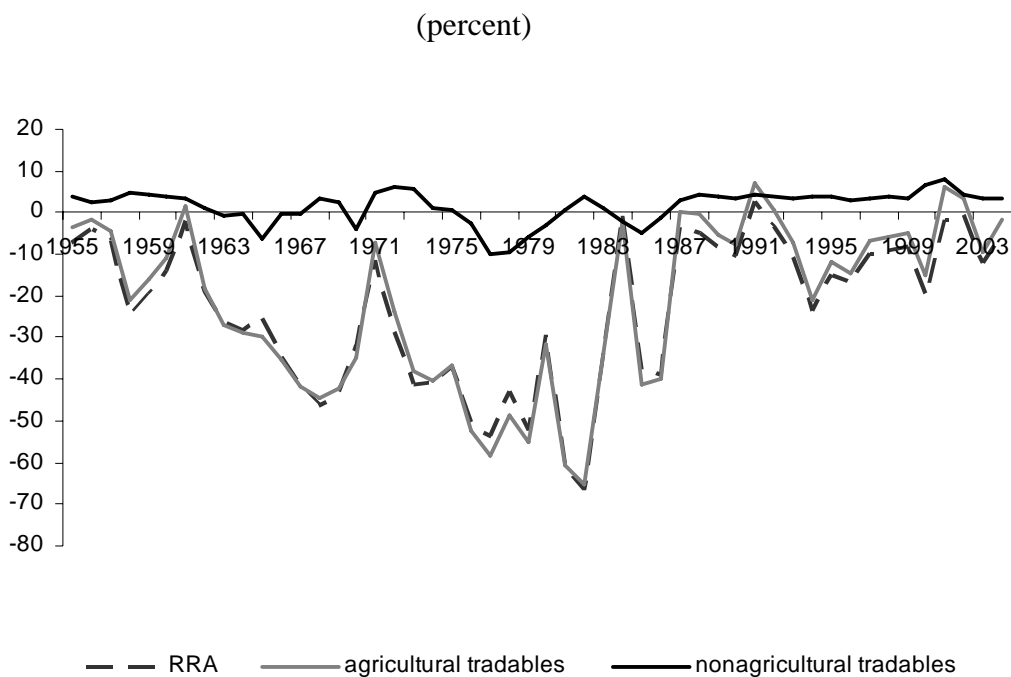
(percent)

Source: Authors' spreadsheet

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.

Table 1: Trade and exchange rate performance, Ghana, 1966 to 2004

	1966-1970	1971-1975	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000	2001-2004
Exports of goods and services (percent of GDP)	19	19	11	7	18	21	36	41
Exports of goods and services (annual percent growth)	-1.9	-2.8	-7.9	-1.6	9.2	7.1	12.3	1.1
Trade (percent of GDP)	39	38	22	14	42	53	87	97
Official exchange rate (LCU per US$, period average)	0.9	1.2	1.9	21	208	722	2825	8196
Real effective exchange rate index (2000 = 100)	na	na	802	1306	190	139	137	101
Black market premium (percent)	72	35	367	1289	47	3	1	0

Source: World Bank (2006a).

Table 2: Nominal rates of assistance to covered farm products, Ghana, 1955 to 2004

(percent)

	1955-59	1960-64	1965-69	1970-74	1975-79	1980-84[d]	1985-89	1990-94	1995-99	2000-04
Exportables [a, b]	**-14.1**	**-23.7**	**-57.3**	**-49.6**	**-80.9**	**-83.2**	**-56.6**	**-36.2**	**-19.4**	**-19.6**
Cocoa	-14.1	-23.7	-57.3	-49.6	-80.9	-83.2	-56.6	-36.2	-30.9	-21.7
Import-competing products [a, b]	**-12.1**	**-10.4**	**-13.6**	**0.3**	**0.1**	**40.2**	**69.4**	**33.2**	**13.2**	**35.8**
Rice	-6.3	-27.9	-36.9	-15.1	-21.3	26.6	79.6	21.7	10.9	30.9
Nontradables [a]	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Yams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cassava	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plantains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mixed trade status [a]										
Maize	-14.2	-4.1	-1.3	6.7	21.3	56.2	66.1	38.5	3.8	39.0
Groundnuts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.4	-14.7
Total of covered products [a]	**-7.0**	**-13.5**	**-28.2**	**-23.0**	**-41.0**	**-32.5**	**-8.3**	**-3.1**	**-4.6**	**-2.4**
Dispersion of covered products [c]	11.4	19.4	30.2	29.0	47.9	69.6	56.3	26.2	17.2	25.5
% coverage (at undistorted prices)	73	73	74	69	66	71	82	77	78	80

Source: Authors' 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 on 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. Data for 1983 are omitted because they are unreliable

Table 3: Nominal rates of assistance to agricultural relative to nonagricultural industries, Ghana, 1955 to 2004

(percent)

	1955-59	1960-64	1965-69	1970-74	1975-79	1980-84[c]	1985-89	1990-94	1995-99	2000-04
Covered products	-7.0	-13.5	-28.2	-23.0	-41.0	-32.5	-8.3	-3.1	-4.6	-2.4
Non-covered products	2.7	3.2	3.6	3.2	3.5	3.2	3.4	2.7	2.6	2.6
All agricultural products	-4.4	-9.0	-19.8	-14.9	-25.6	-21.2	-6.3	-1.7	-3.0	-1.4
Trade bias index[a]	-0.22	-0.34	-0.59	-0.53	-0.79	-0.84	-0.69	-0.46	-0.32	-0.37
Assistance to just tradables:										
NRA, all agricultural tradables	-9.3	-16.6	-38.8	-28.9	-50.2	-39.9	-17.3	-5.7	-8.8	-3.3
NRA, all non-agricultural tradables	3.7	1.5	-0.3	2.7	-5.5	-0.1	1.0	3.8	3.4	5.2
Relative rate of assistance, RRA[b]	-12.5	-18.0	-38.4	-30.8	-47.5	-39.3	-18.7	-9.2	-11.7	-8.0
MEMO, ignoring exchange rate distortions:										
NRA, all agricultural products	-3.4	-1.1	-8.6	-10.6	-8.2	-0.7	-0.7	-1.4	-2.9	-1.4
Trade bias index[a]	-0.19	-0.11	-0.22	-0.39	-0.42	0.05	-0.53	-0.44	-0.31	-0.37
RRA (relative rate of assistance)[b]	-10.9	-6.2	-21.9	-25.4	-24.5	-5.4	-7.3	-8.5	-11.6	-8.0

Source: Authors' spreadsheet

a. 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.
b. 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.
c. Data for 1983 are omitted because they are unreliable

Appendix: Quantity and price data, assumptions and sources

Quantity data for agricultural products

For all products (cocoa beans, maize, rice, groundnuts, cassava, yams and plantains) quantity data are taken from FAOSTAT. Apparent consumption is equal to output plus imports minus exports plus the change in stocks.

Farm-gate product prices

The producer price for cocoa beans is obtained from COCOBOD.
For all other crops, producer prices are derived from wholesale prices.
- Maize (1955-2004): Stryker's wholesale/farm-gate margins are used until 1985; a 2004 MOFA survey margin of 33% is applied for that year, and adjusted for previous years by the CPI such that it converges on the 1985 estimate.
- Rice (1955-2004): Stryker's wholesale/farm-gate margins are used until 1985; these are then increased by the CPI, anchored on MOFA survey estimate for 2004.
- Groundnuts (1963-2004): a constant margin of 20% is assumed, based on 2004 MOFA estimate.
- Cassava (1963-2004): 30% wholesale/farm-gate margin, based on Techiman-Accra estimate (MOFA).
- Yams (1955-2004): 21% wholesale/farm-gate margin, based on Techiman-Accra estimate (MOFA).
- Plantains (1970-2004): 18% wholesale/farm-gate margin, based on Techiman-Accra estimate (MOFA).

Wholesale product prices

There are no wholesale prices for cocoa beans. All other wholesale prices are taken from MOFA.

Border prices

- For cocoa beans, the f.o.b. price is taken to be the quoted price of Ghanaian cocoa in New York and London. On average, this price corresponds to the export unit value reported by COMTRADE.
- For maize, the US f.o.b. price of yellow maize (IMF, IFS) is used and a constant 1.4 c.i.f./f.o.b. ratio is applied, based on the estimates of a broker.
- For rice, the Thai f.o.b. price for 5% broken rice is used (IMF, IFS), with a 1.4 c.i.f./f.o.b. ratio used.
- For groundnuts, the Nigerian f.o.b. price is used (IMF, IFS). For each year, this is multiplied by the average ratio of Ghana's export unit value (COMTRADE) to the Nigerian f.o.b. price over the period 1996-2004 (when Ghana was exporting).

Exchange rates

Official exchange rates are from IMF International Financial Statistics.
Black market exchange rate taken from the compilation of Easterly (2006).

The parallel exchange rate is assumed to be the black market rate in those years when a black market premium existed. Exporters of cocoa beans are assumed to have been able to convert half their foreign currency earnings into cedis at the black market rate.

List of data sources

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Appendix Figure 1: GDP growth and per capita GDP growth, Ghana, 1961 to 2003
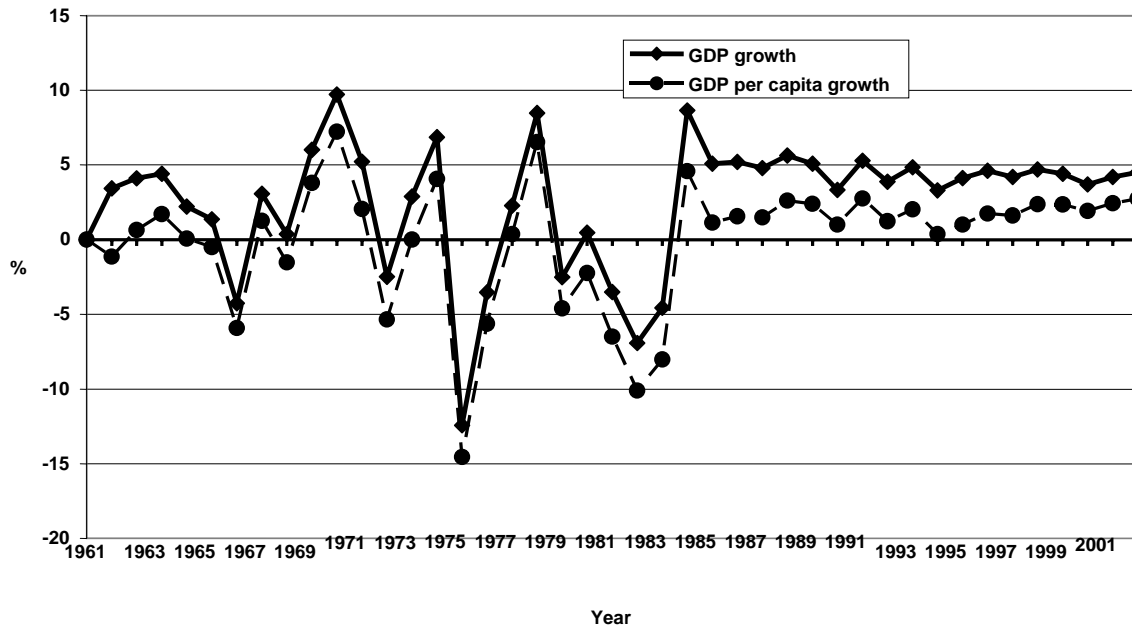
Source: World Bank (2006a).

Appendix Figure 2: Real GDP (1995 US Dollars) per capita, Ghana, 1960 to 2002

Year

Source: World Bank (2006a).

Appendix Figure 3: Consumer price inflation, Ghana, 1965 to 2002
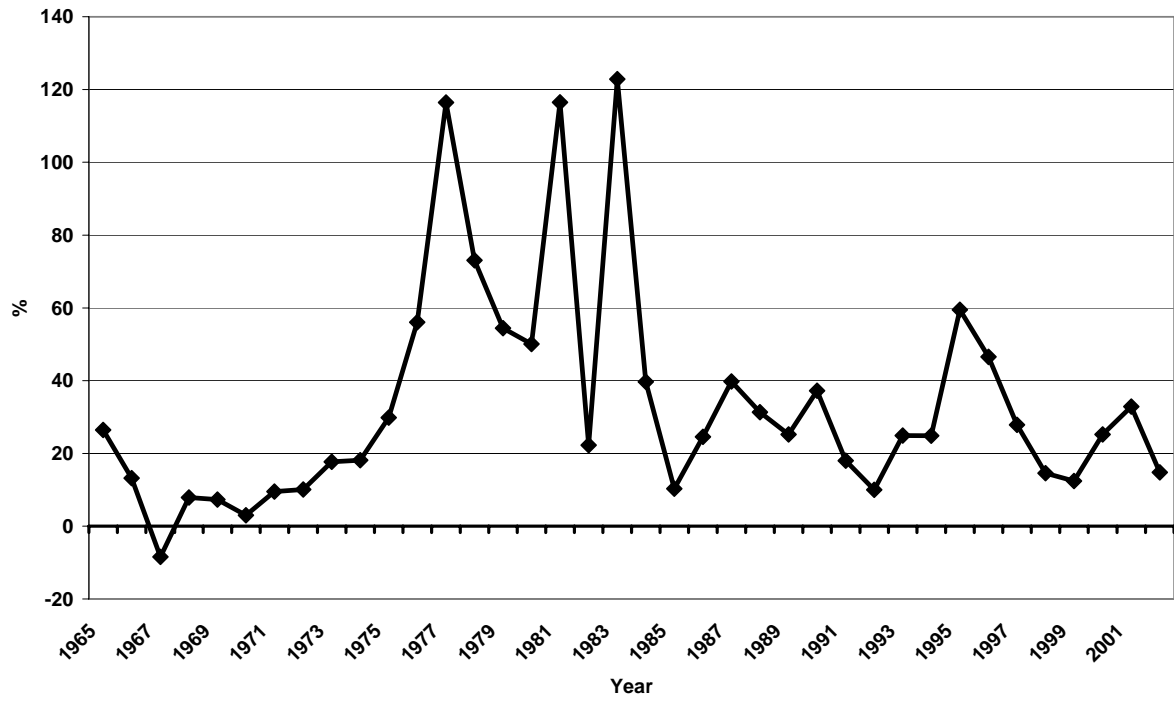
Source: World Bank (2006a).

Appendix Figure 5: Real agricultural growth and agriculture's share of GDP, Ghana, 1960 to 2002
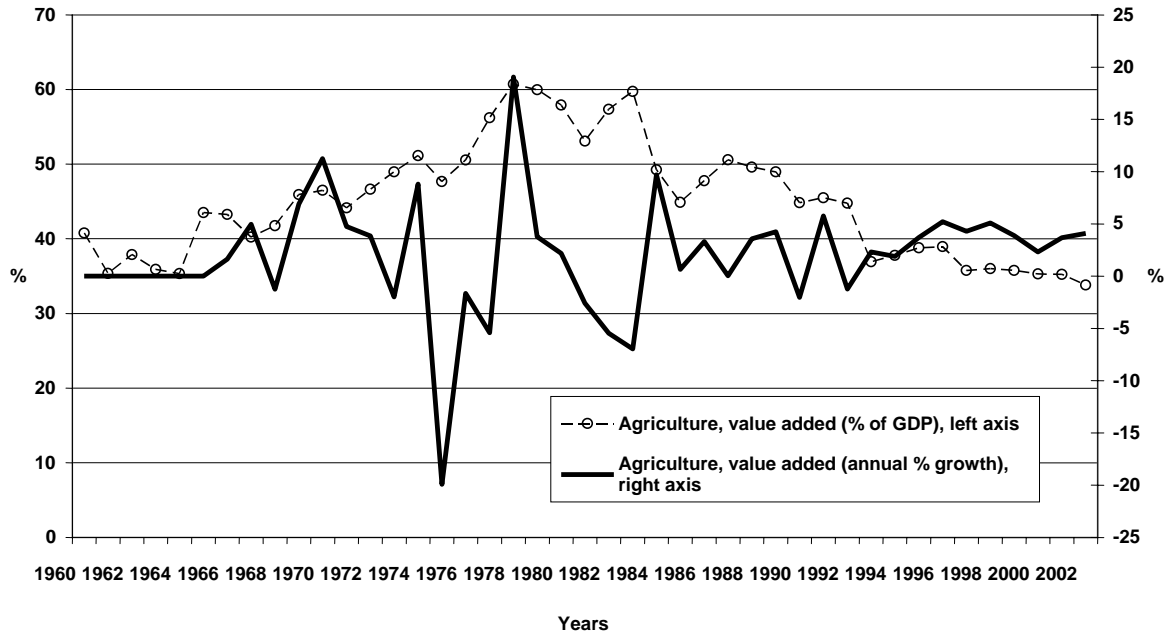
Source: World Bank (2006a).

Appendix Figure 6: Cocoa beans prices, Ghana, 1955 to 2004

(a) allocation of fob export price
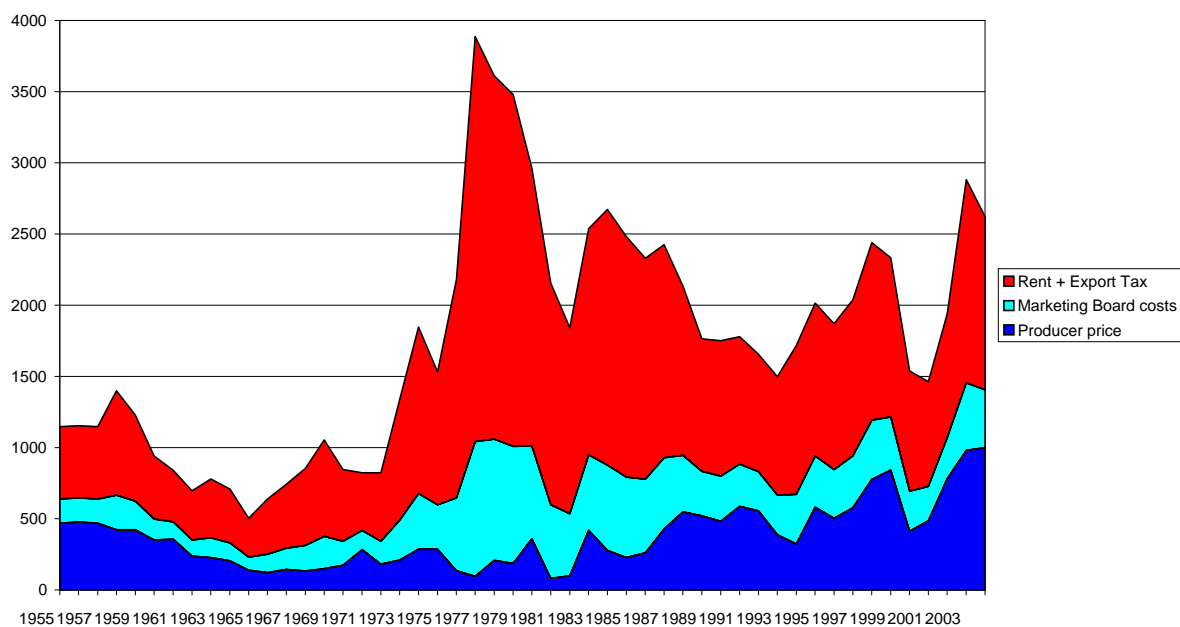
(b) Allocation of FOB export price, based on data on export tax payments in the 1990s
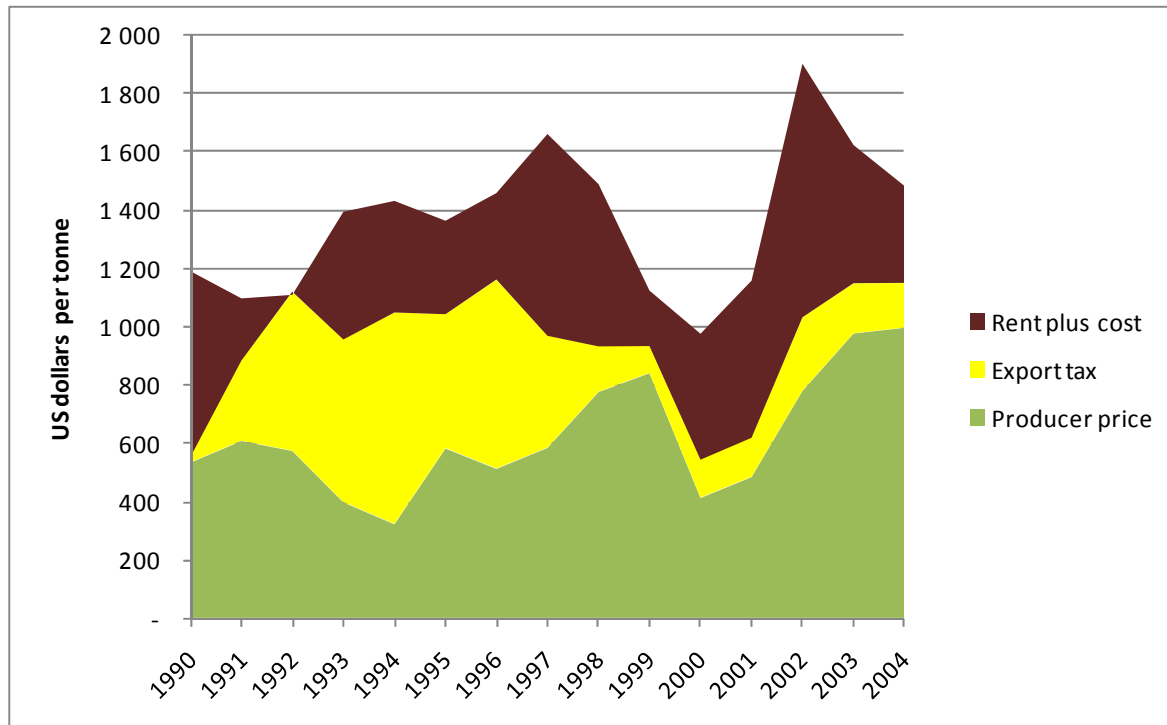
Source: COCOBOD.

Note that the export tax is calculated by dividing COCOBOD payments by the number of tonnes produced that year. The timing of payments may not correspond to the precise dates for which duties were applicable, so the series may not be perfectly comparable with the two price series.

Appendix Figure 6 (cont'd): Cocoa beans prices, Ghana, 1955 to 2004

(c) Bean prices, cedis/ton
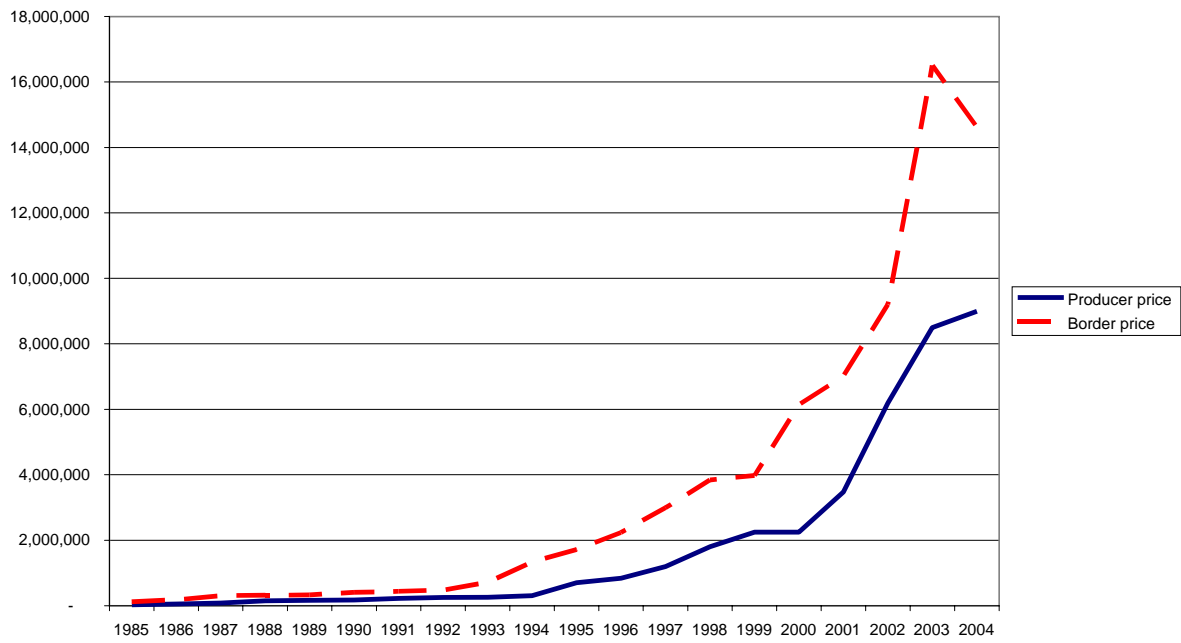
Appendix Figure 7: Rice prices, Ghana, 1955 to 2004
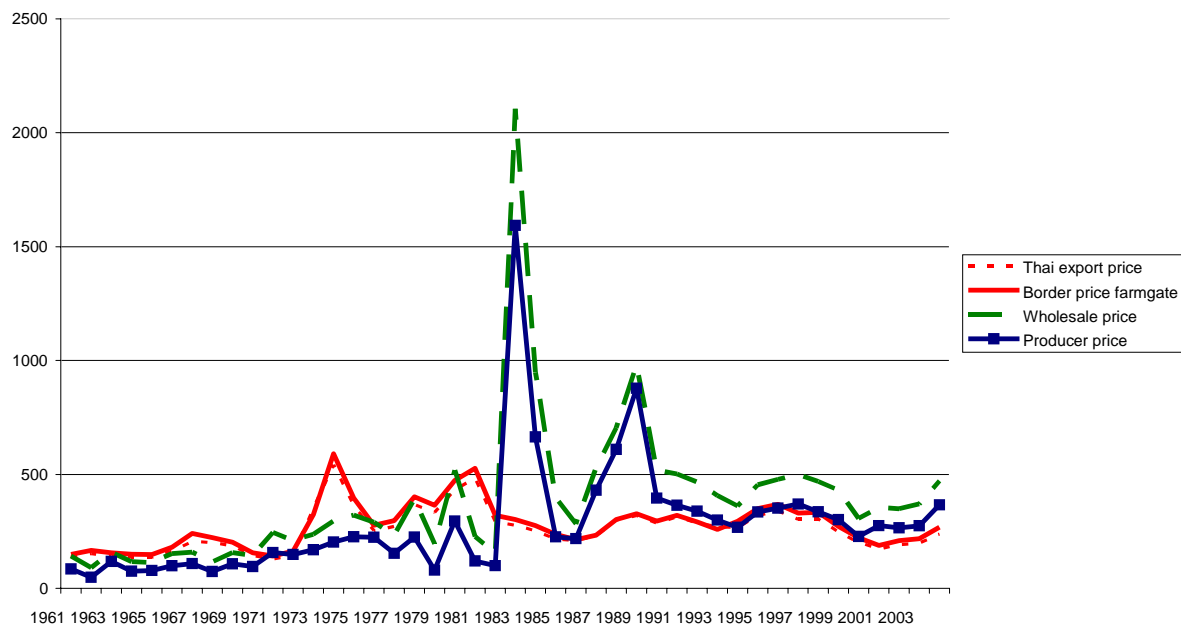
(a) US dollars per MT
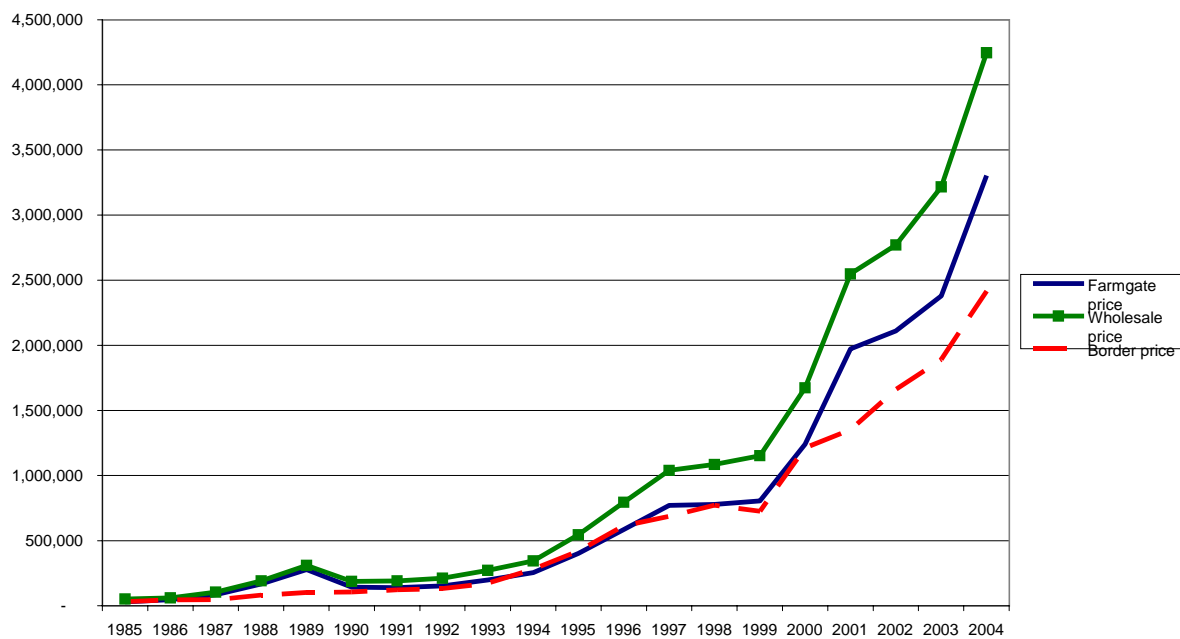
(b) Cedis per MT

Appendix Figure 8: Maize prices, Ghana, 1955 to 2004
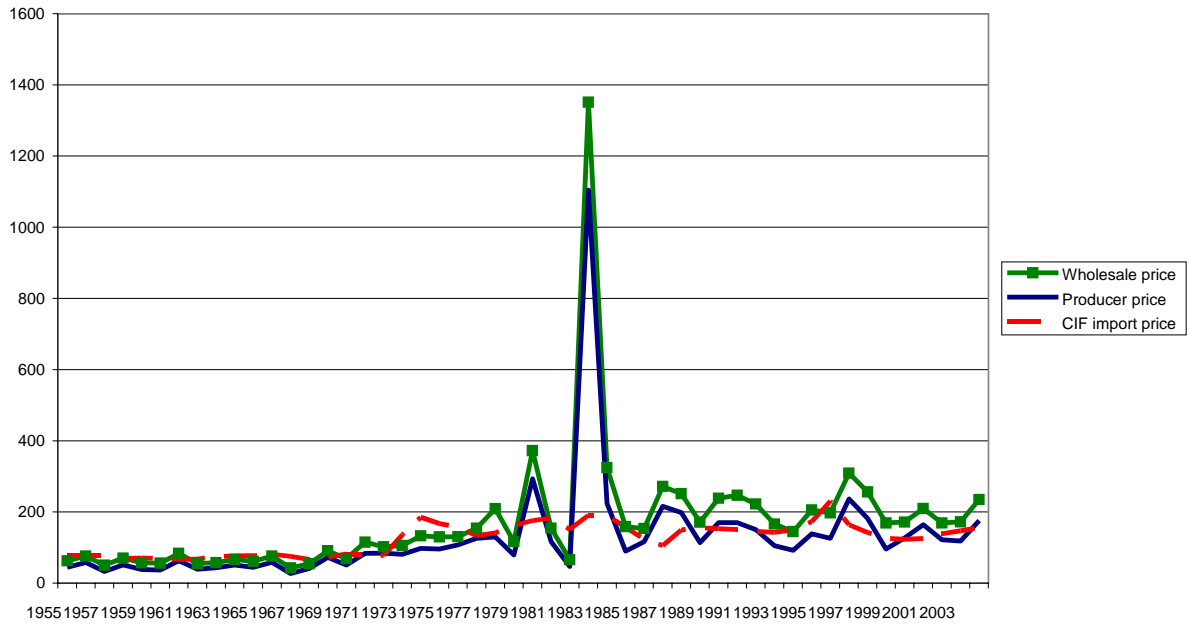
(a) US dollars per MT
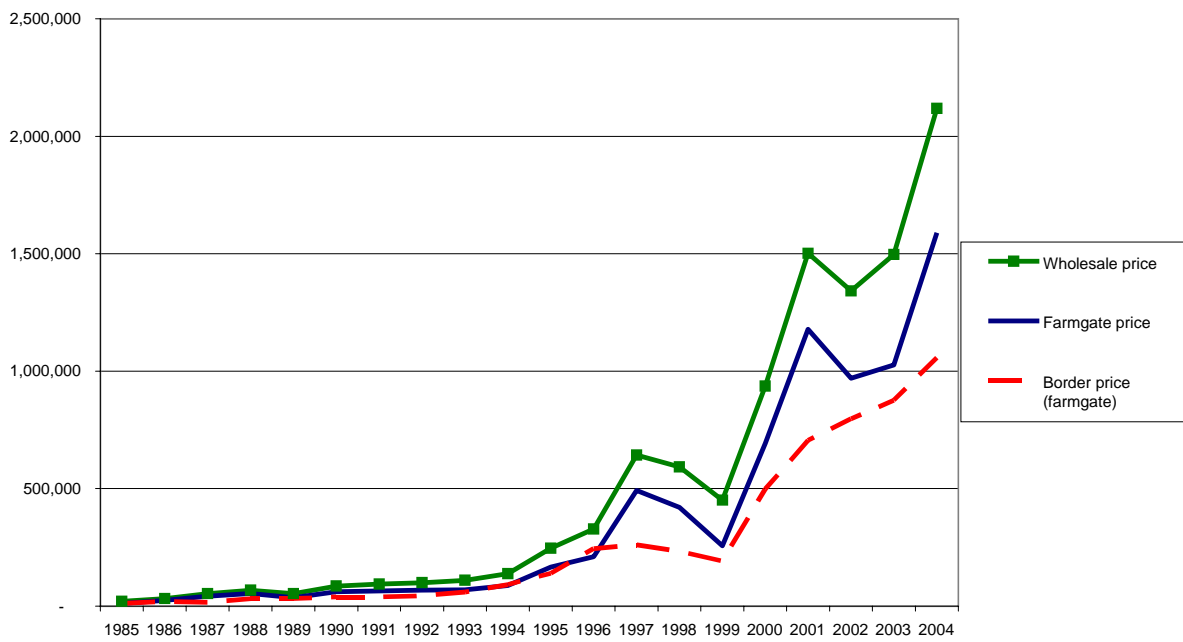
(b) Cedis per MT

Appendix Figure 9: Groundnut prices, Ghana, 1955 to 2004

(a) US dollars per MT
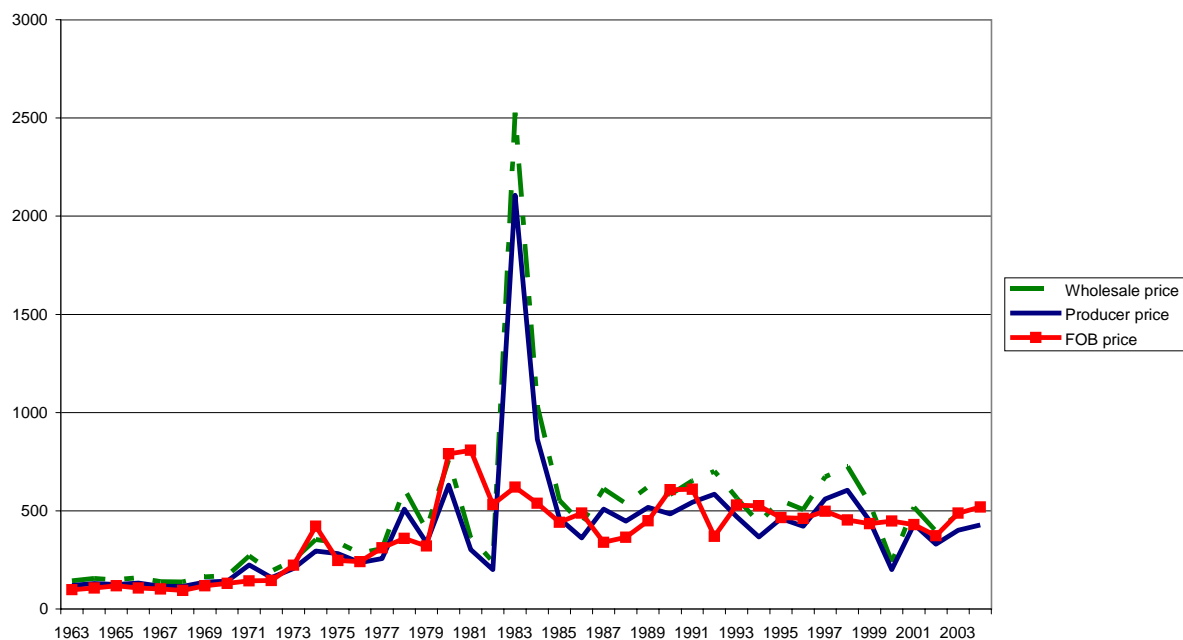
(b) Cedis per MT
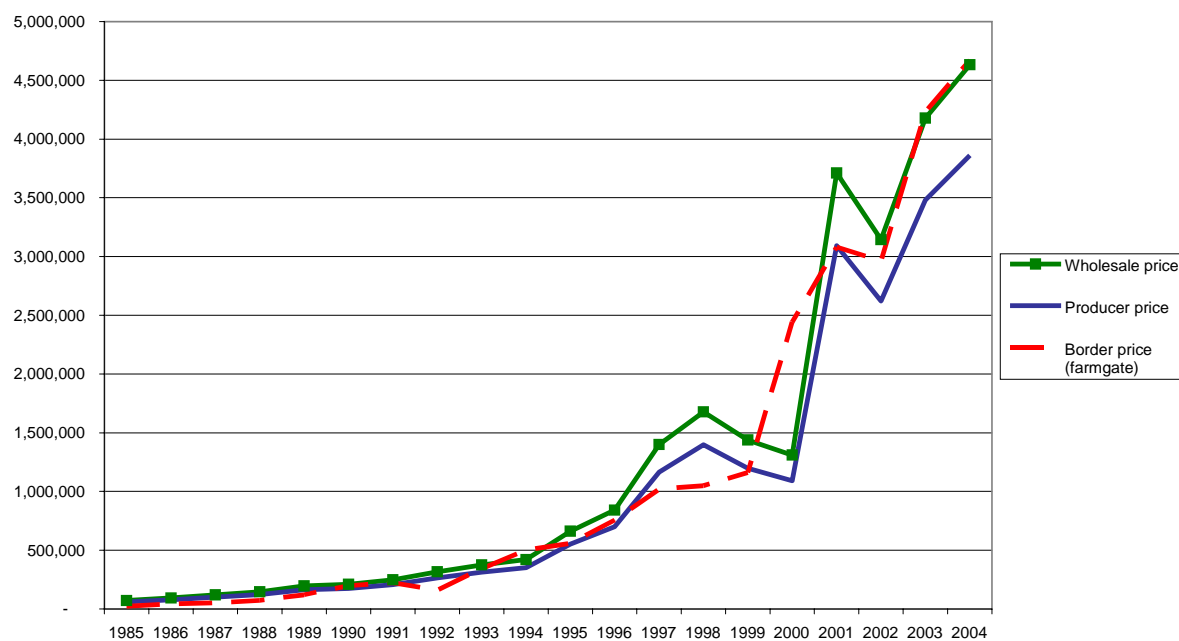
Appendix Table 1: Economic growth in Ghana and Sub-Saharan Africa, 1961 to 2004

Country/sub-region	Economic Indicator	1966-1970	1971-1975	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000	2001-2004
Ghana	GDP growth (annual percent)	3.0	0.0	1.0	**-0.3**	4.8	4.3	4.3	4.9
	GDP per capita (constant 2000 US$)	262	276	238	**196**	205	222	242	266
	GDP per capita growth (annual percent)	1.1	-2.6	-0.9	**-3.6**	1.8	1.5	2.0	2.7
	Inflation, consumer prices (annual percent)	4.6	17.1	70.0	**62.3**	31.6	27.5	25.3	21.8
Sub-Saharan Africa	GDP growth (annual percent)	4.7	4.3	3.1	**1.2**	2.6	1.2	3.4	3.9
	GDP per capita (constant 2000 US$)	502	566	575	**547**	524	489	500	521
	GDP per capita growth (annual percent)	2.0	1.5	0.1	**-1.7**	-0.3	-1.4	0.8	1.6

Source: World Bank (2006a).

Appendix Table 2: Food poverty incidence by location, region and at the national level, Ghana, 1991/92 and 1998/99

Location	Poverty Index	% Contribution to National Poverty	Poverty Index	% Contribution to National Poverty
	1991/92		**1998/99**	
Urban	15.1	13.7	11.6	14.4
Rural	47.2	86.3	34.4	85.6
Region				
Western	42	11.7	13.6	5.9
Central	24.1	6.8	31.5	10.5
Greater Accra	13.4	4.3	2.4	1.1
Eastern	34.8	12.3	30.4	13.2
Volta	42.1	10.4	20.4	9.5
Ashanti	25.5	11.1	16.4	10.3
Brong Ahafo	45.9	14.9	18.8	6.1
Northern	54.1	14	57.4	21.9
Upper West	74.3	6.4	68.3	8.2
Upper East	53.5	8.2	79.6	13.4
National	**36.5**	**100**	**26.8**	**100**

Source: Ghana Statistical Service (2000a).

Appendix Table 3: Poverty incidence by employment category, Ghana, 1991/92 and 1998/99

	Poverty Index	% Contribution to National Poverty	Poverty Index	% Contribution to National Poverty
Economic Activity	**1991/92**		**1998/99**	
Public sector	21.2	7.9	9.5	3.8
Private formal sector	15.1	1.6	4.5	0.8
Private informal sector	22.5	1.9	16.1	1.7
Export farmers	49.6	8.5	19.4	5.1
Food crop farmers	51.8	61.7	45	64.6
Non-farm self employment	23.3	17.7	18.1	22.8
Non-working	13	0.7	15.1	1.2

Source: Ghana Statistical Service (2000a).

Appendix Table 4: Prices for primary products, Ghana, 1960 to 2005

	Cocoa Beans			Maize			Rice		
	Domestic price per MT	Border price per MT	NRA = DP-BP BP	Domestic price per MT	Border price per MT	NRA = DP-BP BP	Domestic price per MT	Border price per MT	NRA = DP-BP BP
1955	474	502	-0.06	47	58	-0.19	135	147	-0.08
1956	479	502	-0.05	57	58	-0.02	138	142	-0.03
1957	474	502	-0.06	38	58	-0.34	138	142	-0.03
1958	491	723	-0.32	53	52	0.03	137	150	-0.09
1959	461	597	-0.23	43	53	-0.18	125	137	-0.09
1960	369	437	-0.15	42	51	-0.18	108	129	-0.17
1961	351	356	-0.01	62	49	0.27	105	140	-0.25
1962	346	464	-0.25	61	69	-0.11	100	216	-0.54
1963	363	577	-0.37	67	79	-0.15	184	210	-0.12
1964	354	578	-0.39	86	88	-0.02	151	221	-0.32
1965	329	586	-0.44	117	124	-0.06	217	306	-0.29
1966	268	652	-0.59	110	102	0.08	220	292	-0.25
1967	328	745	-0.56	58	94	-0.38	218	385	-0.43
1968	422	1,149	-0.63	98	106	-0.08	208	457	-0.55
1969	477	1,341	-0.64	149	108	0.38	258	385	-0.33
1970	466	1,029	-0.55	117	124	-0.06	246	306	-0.19
1971	433	557	-0.22	119	84	0.41	255	189	0.35
1972	508	997	-0.49	167	121	0.38	342	326	0.05
1973	696	1,811	-062	184	219	-0.16	415	665	-0.38
1974	890	2,250	-0.60	205	267	-0.23	455	1,093	-0.58
1975	909	2,156	-0.58	250	290	-0.14	619	880	-0.30
1976	1,176	7,262	-0.84	569	558	0.02	1,263	1,263	0.00
1977	1,825	22,973	-0.92	1,188	809	0.47	1,798	2,311	-0.22
1978	2,834	17,876	-0.84	1,342	741	0.81	2,515	2,709	-0.07
1979	4,931	37,555	-0.87	1,668	1,845	-0.10	2,792	5,338	-0.48
1980	5,790	23,483	-0.75	4,138	1,588	1.61	5,765	5,476	0.05
1981	5,428	79,298	-0.93	7,735	6,982	0.11	11,351	25,813	-0.56
1982	13,197	157,961	-0.92	7,973	13,725	-0.42	18,605	37,248	-0.50
1983	16,677	50,044	-0.67	38,576	4,497	7.58	60,122	9,154	5.57
1984	41,553	150,873	-0.72	23,375	11,975	0.95	68,285	22,240	2.07
1985	60,642	252,574	-0.76	20,858	17,618	0.18	52,176	34,100	0.53
1986	102,725	381,301	-0.73	33,107	22,658	0.46	61,222	50,502	0.21
1987	161,780	373,759	-0.57	53,870	19,781	1.72	105,114	56,162	0.87
1988	230,116	404,227	-0.43	68,588	38,216	0.79	192,215	99,069	0.94
1989	248,849	378,534	-0.34	54,205	47,513	0.14	310,253	127,879	1.43
1990	277,847	447,313	-0.38	86,325	53,971	0.60	187,491	133,678	0.40
1991	333,670	451,502	-0.26	94,345	56,961	0.66	191,787	155,650	0.23
1992	371,336	492,495	-0.25	100,479	65,355	0.54	210,543	167,867	0.25
1993	438,321	735,122	-0.40	110,718	94,501	0.17	271,512	219,722	0.24
1994	641,816	1,335,262	-0.52	138,631	144,360	-0.04	345,736	360,913	-0.04
1995	1,129,916	1,719,664	-0.34	247,084	207,470	0.19	545,677	539,137	0.01
1996	1,398,762	2,261,860	-0.38	328,143	381,624	*0.00*	795,495	784,170	0.01
1997	1,948,071	3,025,668	-0.36	643,258	340,058	*0.00*	1,038,985	877,846	0.18
1998	2,761,477	3,845,909	-0.28	593,091	329,229	*0.00*	1,085,767	989,503	0.10
1999	3,244,448	3,977,791	-0.18	451,532	337,416	*0.00*	1,151,500	930,406	0.24
2000	3,785,736	6,142,943	-0.38	936,633	673,744	0.39	1,672,758	1,555,598	0.08
2001	5,228,520	7,014,079	-0.25	1,501,628	899,601	0.67	2,548,394	1,733,847	0.47
2002	8,500,483	9,201,932	-0.08	1,341,678	1,103,137	0.22	2,770,653	2,130,422	0.30
2003	12,626,003	16,504,011	-0.23	1,496,987	1,277,882	0.17	3,215,866	2,423,104	0.33
2004	12,655,272	14,621,088	-0.13	2,118,782	1,409,153	0.50	4,246,090	3,098,421	0.37

Appendix Table 4 (cont'd): Prices for primary products, Ghana, 1960 to 2005

	Groundnuts			Cassava			Yams		
	Domestic price per MT	Border price per MT	NRA = DP-BP BP	Domestic price per MT	Border price per MT	NRA = DP-BP BP	Domestic price per MT	Border price per MT	NRA = DP-BP BP
1955	n.a.	90	*n.a.*	n.a.	n.a.	n.a.	90	n.a.	n.a.
1956	n.a.	99	*n.a.*	n.a.	n.a.	n.a.	96	n.a.	n.a.
1957	n.a.	96	*n.a.*	n.a.	n.a.	n.a.	90	n.a.	n.a.
1958	n.a.	79	*n.a.*	n.a.	n.a.	n.a.	99	n.a.	n.a.
1959	n.a.	86	*n.a.*	n.a.	n.a.	n.a.	93	n.a.	n.a.
1960	n.a.	94	*n.a.*	n.a.	n.a.	n.a.	94	n.a.	n.a.
1961	n.a.	92	*n.a.*	n.a.	n.a.	n.a.	94	n.a.	n.a.
1962	n.a.	111	*n.a.*	n.a.	n.a.	n.a.	102	n.a.	n.a.
1963	166	115	*n.a.*	28	n.a.	n.a.	91	n.a.	n.a.
1964	202	137	*n.a.*	29	n.a.	n.a.	96	n.a.	n.a.
1965	284	212	*n.a.*	48	n.a.	n.a.	117	n.a.	n.a.
1966	229	150	*n.a.*	44	n.a.	n.a.	132	n.a.	n.a.
1967	191	143	*n.a.*	34	n.a.	n.a.	115	n.a.	n.a.
1968	247	169	*n.a.*	35	n.a.	n.a.	122	n.a.	n.a.
1969	269	196	*n.a.*	44	n.a.	n.a.	136	n.a.	n.a.
1970	288	223	*n.a.*	43	n.a.	n.a.	139	n.a.	n.a.
1971	279	166	*n.a.*	54	n.a.	n.a.	155	n.a.	n.a.
1972	312	252	*n.a.*	64	n.a.	n.a.	177	n.a.	n.a.
1973	434	401	*n.a.*	67	n.a.	n.a.	218	n.a.	n.a.
1974	545	682	*n.a.*	80	n.a.	n.a.	279	n.a.	n.a.
1975	652	479	*n.a.*	122	n.a.	n.a.	381	n.a.	n.a.
1976	1,234	960	*n.a.*	252	n.a.	n.a.	552	n.a.	n.a.
1977	2,369	2,119	*n.a.*	653	n.a.	n.a.	1,164	n.a.	n.a.
1978	3,913	2,119	*n.a.*	608	n.a.	n.a.	1,886	n.a.	n.a.
1979	5,782	4,105	*n.a.*	720	n.a.	n.a.	2,340	n.a.	n.a.
1980	8,416	7,992	*n.a.*	1,518	n.a.	n.a.	3,829	n.a.	n.a.
1981	18,122	34,634	*n.a.*	3,730	n.a.	n.a.	6,179	n.a.	n.a.
1982	28,917	54,128	*n.a.*	4,203	n.a.	n.a.	8,625	n.a.	n.a.
1983	72,140	16,446	*n.a.*	16,450	n.a.	n.a.	28,078	n.a.	n.a.
1984	74,558	38,001	*n.a.*	9,296	n.a.	n.a.	27,842	n.a.	n.a.
1985	72,463	55,523	*n.a.*	8,731	n.a.	n.a.	27,253	n.a.	n.a.
1986	93,795	100,890	*n.a.*	15,482	n.a.	n.a.	36,047	n.a.	n.a.
1987	121,150	71,247	*n.a.*	34,992	n.a.	n.a.	43,075	n.a.	n.a.
1988	146,588	104,593	*n.a.*	17,638	n.a.	n.a.	77,546	n.a.	n.a.
1989	196,588	153,674	*n.a.*	27,264	n.a.	n.a.	94,399	n.a.	n.a.
1990	210,456	240,402	*n.a.*	48,713	n.a.	n.a.	120,409	n.a.	n.a.
1991	249,492	258,936	*n.a.*	43,956	n.a.	n.a.	117,877	n.a.	n.a.
1992	316,744	186,022	*n.a.*	44,479	n.a.	n.a.	116,281	n.a.	n.a.
1993	375,999	392,452	*n.a.*	59,574	n.a.	n.a.	160,393	n.a.	n.a.
1994	421,662	563,537	*n.a.*	63,001	n.a.	n.a.	213,241	n.a.	n.a.
1995	662,753	626,976	*n.a.*	104,947	n.a.	n.a.	328,874	n.a.	n.a.
1996	841,768	858,421	-0.02	113,069	n.a.	n.a.	389,947	n.a.	n.a.
1997	1,399,693	1,159,022	0.21	174,484	n.a.	n.a.	568,343	n.a.	n.a.
1998	1,678,501	1,176,741	0.43	309,453	n.a.	n.a.	958,146	n.a.	n.a.
1999	1,438,266	1,301,921	0.10	211,377	n.a.	n.a.	665,735	n.a.	n.a.
2000	1,309,847	2,740,432	-0.52	371,398	n.a.	n.a.	861,137	n.a.	n.a.
2001	3,711,702	3,454,395	0.07	887,984	n.a.	n.a.	1,429,998	n.a.	n.a.
2002	3,145,012	3,322,643	-0.05	710,819	n.a.	n.a.	1,680,016	n.a.	n.a.
2003	4,177,397	4,749,839	-0.12	632,214	n.a.	n.a.	1,854,283	n.a.	n.a.
2004	4,632,889	5,240,527	-0.12	804,534	n.a.	n.a.	2,164,032	n.a.	n.a.

Appendix Table 4 (cont'd): Prices for primary products, Ghana, 1960 to 2005

	Plantains		
	Domestic price per MT	Border price per MT	NRA = DP-BP BP
1955	n.a.	n.a.	n.a.
1956	n.a.	n.a.	n.a.
1957	n.a.	n.a.	n.a.
1958	n.a.	n.a.	n.a.
1959	n.a.	n.a.	n.a.
1960	n.a.	n.a.	n.a.
1961	n.a.	n.a.	n.a.
1962	n.a.	n.a.	n.a.
1963	n.a.	n.a.	n.a.
1964	n.a.	n.a.	n.a.
1965	n.a.	n.a.	n.a.
1966	n.a.	n.a.	n.a.
1967	n.a.	n.a.	n.a.
1968	n.a.	n.a.	n.a.
1969	n.a.	n.a.	n.a.
1970	35	n.a.	n.a.
1971	55	n.a.	n.a.
1972	46	n.a.	n.a.
1973	67	n.a.	n.a.
1974	73	n.a.	n.a.
1975	92	n.a.	n.a.
1976	189	n.a.	n.a.
1977	556	n.a.	n.a.
1978	822	n.a.	n.a.
1979	903	n.a.	n.a.
1980	1,355	n.a.	n.a.
1981	2,042	n.a.	n.a.
1982	2,818	n.a.	n.a.
1983	11,948	n.a.	n.a.
1984	13,036	n.a.	n.a.
1985	13,505	n.a.	n.a.
1986	14,906	n.a.	n.a.
1987	28,297	n.a.	n.a.
1988	32,318	n.a.	n.a.
1989	43,328	n.a.	n.a.
1990	71,615	n.a.	n.a.
1991	55,417	n.a.	n.a.
1992	66,833	n.a.	n.a.
1993	100,646	n.a.	n.a.
1994	121,245	n.a.	n.a.
1995	259,969	n.a.	n.a.
1996	230,813	n.a.	n.a.
1997	408,599	n.a.	n.a.
1998	514,917	n.a.	n.a.
1999	382,729	n.a.	n.a.
2000	873,630	n.a.	n.a.
2001	1,409,161	n.a.	n.a.
2002	1,066,307	n.a.	n.a.
2003	1,199,281	n.a.	n.a.
2004	1,531,917	n.a.	n.a.

Source: Authors' spreadsheet

Note. NRA set to zero for maize in 1996-99 (when exported), for groundnuts prior to 1996 (when not traded).

Appendix Table 5: Exchange rate, Ghana, 1960 to 2005

(cedis per US dollar)

	Official rate	Commodity specific rate (add if necessary)	Secondary/parallel market rate	Retention rate [a]	Discount to secondary market rate	Estimated equilibrium exchange rate using this study's methodology [b]
1955	0.71	n.a.	0.75	0.5	0.05	0.74
1956	0.71	n.a.	0.75	0.5	0.05	0.74
1957	0.71	n.a.	0.75	0.5	0.05	0.74
1958	0.71	n.a.	0.75	0.5	0.05	0.74
1959	0.71	n.a.	0.75	0.5	0.05	0.74
1960	0.71	n.a.	0.75	0.5	0.05	0.74
1961	0.71	n.a.	0.74	0.5	0.03	0.73
1962	0.71	n.a.	1.11	0.5	0.36	1.01
1963	0.71	n.a.	1.16	0.5	0.38	1.05
1964	0.71	n.a.	1.29	0.5	0.45	1.15
1965	0.71	n.a.	1.90	0.5	0.62	1.60
1966	0.71	n.a.	1.44	0.5	0.50	1.26
1967	0.87	n.a.	1.37	0.5	0.37	1.25
1968	1.02	n.a.	1.79	0.5	0.43	1.59
1969	1.02	n.a.	1.64	0.5	0.38	1.48
1970	1.02	n.a.	1.69	0.5	0.40	1.53
1971	1.03	n.a.	1.03	0.5	0.00	1.03
1972	1.33	n.a.	1.63	0.5	0.18	1.55
1973	1.17	n.a.	1.75	0.5	0.33	1.60
1974	1.15	n.a.	1.54	0.5	0.25	1.44
1975	1.15	n.a.	1.92	0.5	0.40	1.73
1976	1.15	n.a.	4.35	0.5	0.74	3.55
1977	1.15	n.a.	7.70	0.5	0.85	6.06
1978	1.76	n.a.	6.41	0.5	0.73	5.25
1979	2.75	n.a.	14.29	0.5	0.81	11.41
1980	2.75	n.a.	11.11	0.5	0.75	9.02
1981	2.75	n.a.	50.00	0.5	0.94	38.19
1982	2.75	n.a.	120.00	0.5	0.98	90.69
1983	8.83	n.a.	28.55	0.5	0.69	23.62
1984	35.99	n.a.	71.97	0.5	0.50	62.98
1985	54.37	n.a.	131.25	0.5	0.59	112.03
1986	89.20	n.a.	216.07	0.5	0.59	184.35
1987	153.73	n.a.	198.21	0.5	0.22	187.09
1988	202.35	n.a.	272.86	0.5	0.26	255.23
1989	270.00	n.a.	316.31	0.5	0.15	304.73
1990	326.33	n.a.	361.58	0.5	0.10	352.77
1991	367.83	n.a.	382.17	0.5	0.04	378.58
1992	437.09	n.a.	451.58	0.5	0.03	447.96
1993	649.06	n.a.	665.67	0.5	0.02	661.52
1994	956.71	n.a.	956.71	0.5	0.00	956.71
1995	1200.43	n.a.	1200.43	0.5	0.00	1200.43
1996	1637.23	n.a.	1663.42	0.5	0.02	1656.87
1997	2050.17	n.a.	2080.67	0.5	0.01	2073.04
1998	2314.15	n.a.	2314.15	0.5	0.00	2314.15
1999	2669.30	n.a.	2669.30	0.5	0.00	2669.30
2000	5455.06	n.a.	5455.06	0.5	0.00	5455.06
2001	7170.76	n.a.	7170.76	0.5	0.00	7170.76
2002	7932.70	n.a.	7932.70	0.5	0.00	7932.70
2003	8677.37	n.a.	8677.37	0.5	0.00	8677.37
2004	9004.63	n.a.	9004.63	0.5	0.00	9004.63

[a] The proportion of foreign currency actually sold by all exporters at the parallel market rate.
[b] See Anderson et al. (2008) on the exchange rate methodology used in this study

Appendix Table 6: Annual distortion estimates, Ghana, 1955 to 2004
  (a) Nominal rates of assistance to covered products
(percent)

	Cassava	Cocoa	Groundnut	Maize	Plantain	Rice	Yam	All covered
1955	0	-6	0	-19	0	-8	0	-3
1956	0	-5	0	-2	0	-3	0	-2
1957	0	-6	0	-34	0	-3	0	-3
1958	0	-32	0	3	0	-9	0	-15
1959	0	-23	0	-18	0	-9	0	-12
1960	0	-15	0	-18	0	-17	0	-8
1961	0	-1	0	27	0	-25	0	0
1962	0	-25	0	-11	0	-54	0	-14
1963	0	-37	0	-15	0	-12	0	-21
1964	0	-39	0	-2	0	-32	0	-24
1965	0	-44	0	-6	0	-29	0	-22
1966	0	-59	0	8	0	-25	0	-25
1967	0	-56	0	-38	0	-43	0	-30
1968	0	-63	0	-8	0	-55	0	-32
1969	0	-64	0	38	0	-33	0	-32
1970	0	-55	0	-6	0	-19	0	-28
1971	0	-22	0	41	0	35	0	-6
1972	0	-49	0	38	0	5	0	-19
1973	0	-62	0	-16	0	-38	0	-31
1974	0	-60	0	-23	0	-58	0	-31
1975	0	-58	0	-14	0	-30	0	-27
1976	0	-84	0	2	0	0	0	-43
1977	0	-92	0	47	0	-22	0	-47
1978	0	-84	0	81	0	-7	0	-35
1979	0	-87	0	-10	0	-48	0	-53
1980	0	-75	0	161	0	5	0	-23
1981	0	-93	0	11	0	-56	0	-46
1982	0	-92	0	-42	0	-50	0	-59
1983	na	na	na	na	na	na	na	na
1984	0	-72	0	95	0	207	0	-1
1985	0	-76	0	18	0	53	0	-18
1986	0	-73	0	46	0	21	0	-19
1987	0	-57	0	172	0	87	0	-1
1988	0	-43	0	79	0	94	0	-1
1989	0	-34	0	14	0	143	0	-3
1990	0	-38	0	60	0	40	0	-4
1991	0	-26	0	66	0	23	0	1
1992	0	-25	0	54	0	25	0	-1
1993	0	-40	0	17	0	24	0	-3
1994	0	-52	0	-4	0	-4	0	-9
1995	0	-34	0	19	0	1	0	-5
1996	0	-38	-2	0	0	1	0	-8
1997	0	-36	21	0	0	18	0	-4
1998	0	-28	43	0	0	10	0	-3
1999	0	-18	10	0	0	24	0	-3
2000	0	-38	-52	39	0	8	0	-7
2001	0	-25	7	67	0	47	0	1
2002	0	-8	-5	22	0	30	0	1
2003	0	-23	-12	17	0	33	0	-5
2004	0	-13	-12	50	0	37	0	-1

Appendix Table 6 (continued): Annual distortion estimates, Ghana, 1955 to 2004
(b) Nominal and relative rates of assistance to all[a] agricultural products, to exportable[b] and import-competing [b] agricultural industries, and relative[c] to non-agricultural industries (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							
1955	0	-3	3	-1	-7	7	-3	4	-7
1956	0	-2	3	-1	-6	13	-2	2	-4
1957	0	-3	3	-2	-7	4	-4	3	-7
1958	0	-15	3	-10	-31	14	-21	5	-25
1959	0	-12	3	-8	-23	10	-16	4	-20
1960	0	-8	3	-5	-16	10	-11	4	-14
1961	0	0	3	1	-3	19	2	4	-2
1962	0	-14	3	-9	-26	13	-18	1	-19
1963	0	-21	4	-14	-36	16	-27	-1	-26
1964	0	-24	4	-16	-38	19	-29	0	-28
1965	0	-22	4	-15	-43	18	-30	-6	-25
1966	0	-25	4	-17	-56	18	-35	0	-35
1967	0	-30	4	-22	-53	-5	-42	0	-42
1968	0	-32	4	-23	-60	1	-44	3	-46
1969	0	-32	4	-22	-61	23	-42	2	-44
1970	0	-28	4	-19	-52	12	-35	-4	-32
1971	0	-6	3	-3	-22	28	-7	5	-11
1972	0	-19	3	-12	-46	27	-24	6	-28
1973	0	-31	3	-20	-57	1	-38	6	-41
1974	0	-31	3	-21	-56	-10	-40	1	-41
1975	0	-27	4	-18	-54	7	-37	0	-37
1976	0	-43	4	-27	-77	26	-52	-3	-51
1977	0	-47	3	-30	-85	37	-58	-10	-54
1978	0	-35	4	-22	-76	40	-49	-10	-43
1979	0	-53	3	-30	-79	26	-55	-6	-52
1980	0	-23	4	-14	-68	69	-32	-3	-29
1981	0	-46	3	-32	-87	15	-61	1	-61
1982	0	-59	3	-38	-85	10	-65	4	-67
1983	na	na	na	na	na	na	na	na	na
1984	0	-1	4	-1	-65	84	-2	-2	0
1985	0	-18	4	-14	-72	31	-41	-5	-38
1986	0	-19	4	-15	-69	41	-40	-1	-39
1987	0	-1	3	0	-52	90	0	3	-3
1988	0	-1	3	0	-41	67	0	5	-5
1989	0	-3	3	-2	-33	39	-5	4	-9
1990	0	-4	3	-2	-35	39	-7	3	-11
1991	0	1	3	2	-25	37	7	4	2
1992	0	-1	3	0	-24	32	1	4	-3
1993	0	-3	3	-2	-36	20	-7	3	-10
1994	0	-9	3	-6	-46	5	-21	4	-24
1995	0	-5	3	-4	-32	16	-12	4	-15
1996	0	-8	3	-5	-24	13	-14	3	-17
1997	0	-4	3	-2	-15	20	-7	3	-10
1998	0	-3	3	-2	-13	18	-6	4	-9
1999	0	-3	3	-2	-13	21	-5	3	-8
2000	0	-7	3	-5	-39	24	-15	7	-20
2001	0	1	3	2	-17	41	6	8	-2
2002	0	1	3	1	-8	22	3	4	-1
2003	0	-5	3	-4	-21	21	-9	3	-12
2004	0	-1	3	-1	-14	33	-2	3	-5

a. NRAs including assistance to nontradables and non-product specific assistance.
b. NRAs including products specific input subsidies.
c. 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.

Appendix Table 6 (continued): Annual distortion estimates, Ghana, 1955 to 2004
(c) Value shares of primary production of covered[a] and non-covered products,
(percent)

	Cassava	Cocoa	Groundnut	Maize	Plantain	Rice	Yam	Non-covered
1955	6	28	2	3	6	1	27	27
1956	6	30	2	3	5	1	26	27
1957	7	27	2	3	6	1	28	27
1958	5	33	2	2	5	1	25	27
1959	5	36	2	2	5	1	23	27
1960	5	36	1	2	5	1	23	27
1961	6	32	2	2	5	1	25	27
1962	5	37	1	3	4	1	22	27
1963	5	40	1	2	4	1	18	27
1964	5	44	1	2	3	1	16	27
1965	9	36	1	3	4	1	19	27
1966	10	31	1	6	4	1	18	27
1967	8	35	1	4	4	3	20	26
1968	6	34	2	4	4	3	20	26
1969	7	37	2	3	4	2	19	27
1970	7	35	3	6	4	1	14	30
1971	10	28	4	4	6	1	18	30
1972	10	30	3	5	4	2	13	32
1973	8	31	4	7	5	3	12	32
1974	7	30	5	7	4	4	14	30
1975	10	31	4	4	6	3	13	30
1976	10	34	3	4	6	2	8	33
1977	12	35	2	2	6	2	7	33
1978	11	29	3	1	8	2	11	35
1979	6	35	3	3	4	1	7	40
1980	12	26	6	3	5	1	12	35
1981	14	34	4	5	3	3	7	29
1982	9	40	4	5	3	1	6	33
1983	na	na	na	na	na	na	na	na
1984	15	12	10	6	13	1	26	17
1985	14	22	8	5	14	1	20	16
1986	19	26	8	5	7	1	17	17
1987	28	14	7	4	10	1	16	19
1988	14	21	9	7	10	3	18	17
1989	16	17	7	5	9	2	22	21
1990	21	17	4	4	10	2	18	24
1991	23	9	2	4	7	2	30	23
1992	23	12	3	4	7	2	26	24
1993	22	9	4	5	9	2	29	21
1994	20	13	4	6	10	3	21	23
1995	19	15	3	5	13	3	21	21
1996	18	16	3	6	10	4	21	23
1997	18	11	3	9	12	2	21	24
1998	21	12	3	5	10	2	26	22
1999	18	17	3	4	9	2	25	23
2000	20	14	4	4	12	2	21	22
2001	31	9	4	3	12	2	21	18
2002	24	10	7	5	9	2	25	18
2003	18	20	6	4	9	2	21	21
2004	18	22	5	4	9	2	20	21

Source: Authors' spreadsheet
a. At farmgate undistorted prices