

GHANA

Strategy Support Program



Curb Your Enthusiasm: Agricultural Growth in Sub-Saharan Africa

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DISCUSSION NOTE # 003

INTRODUCTION

The evidence of improved performance of the agricultural sector in Sub-Saharan Africa (SSA) in recent years has indeed been quite striking. For the first time, agricultural gross domestic product (AgGDP) per capita has maintained a real growth rate of 2.4 percent per year, while real AgGDP growth rates have exceeded 6 percent, a growth rate last seen in the 1970s. Similarly, performance of the overall economy, with average growth rates of 5.3 percent per year, has also been remarkable. In this context, Ghana has shown one of the best performing agricultural sectors in the region with AgGDP growing at more than six percent per capita in recent years.

This evidence has given rise to a debate on the factors driving growth and the implications of this growth for the future performance of agriculture. Has growth in AgGDP been principally riding on the current commodity price boom, or is it mostly the result of underlying changes in productivity or changes in the use of factor endowments? The goal of this brief is to analyze the performance of SSA's agricultural growth over the most past decade with a special focus on Ghana. To determine the drivers of agricultural growth and the factors explaining SSA's performance over time, we adopt a growth accounting approach to decompose growth in agricultural value added or AgGDP into the contribution of changes in the endowments of land, labor and capital; total factor productivity (TFP) changes, movements in the terms of trade or the ratio of export (PX) and import (PM) prices, as well as changes in domestic output prices (PD). Expressed as an equation:

TABLE 1—AGGDP GROWTH DECOMPOSITION

	Labor	Capital	Crop land	Other land	Terms of trade	TFP	Total real effect	Real price	Dollar inflation	AgGDP growth
Growth rate ^a (%)										
1981-1990	0.9	0.4	0.1	0	-0.8	0.6	1.2	-3.1	4.2	-0.8
1991-2000	0.9	0.5	0.2	-0.1	0.1	1.4	3	-5.3	2.1	0.4
2001-2010	0.7	0.7	0.2	0	-0.2	2.2	3.6	3.9	2.3	11.5
Contribution to growth ^b (%)										
1981-1990	40.4	18.3	4.59	0	-36.9	27.5	53.9	-144	190	100
1991-2000 ^b	-184	-107	-43.1	21.6	-21.5	-300	-634	1175	-441	100
2001-2010	7.01	7.23	2.07	0	-2.08	22.6	36.8	39.4	23.8	100

Notes: ^a Decomposition is obtained for multiplicative indices, so growth rates in percentage do not add up to exactly the same growth obtained with the index.

^b Growth in this period is negative. For example, the contribution to negative growth of domestic price (which shows negative growth) is positive.

Source: Nin-Pratt, A., M. Johnson, and B. Yu 2012. *Improved Performance of Agriculture in Sub-Saharan Africa: Taking off or Bouncing Back*. IFPRI Discussion Paper, forthcoming.

$$\frac{AgGDP_t}{AgGDP_{t-1}} = \frac{Labor_t}{Labor_{t-1}} \cdot \frac{Capital_t}{Capital_{t-1}} \cdot \frac{Land_t}{Land_{t-1}} \cdot \frac{TFP_t}{TFP_{t-1}} \cdot \frac{(PX/PM)_t}{(PX/PM)_{t-1}} \cdot \frac{PD_t}{PD_{t-1}}$$

We use data for 22 countries in SSA between 1980 and 2010. Nominal AgGDP values at current US\$ prices are from World Bank (2012). Export and import values from FAOSTAT in current US\$ are used to determine the share of exports, imports, and domestic absorption (C+I+G) in total AgGDP. Export and import prices are indices from FAOSTAT (2012), while AgGDP deflators are used as price indices for each country. Factors used (capital stock, agricultural land, and labor) are also from FAOSTAT (2012).

THE EVIDENCE: THE BEST PERFORMANCE IN 40 YEARS

Results of AgGDP growth decomposition for SSA are presented in Table 1. During the 2001–2010 period, agriculture in SSA grew at an average rate of 10.4%, with almost two thirds of this growth explained by growth in domestic prices (real prices plus dollar

inflation). The most important welfare-enhancing contribution to AgGDP growth comes from TFP, growing at 2 percent and Ex-

gies with growing use of chemical inputs and increased land or labor productivity. Alternative explanations for TFP growth are

TABLE 2—AGGDP GROWTH DECOMPOSITION AND GROWTH PERFORMANCE OF SSA COUNTRIES, 2001-2010 (%)

	Factors of production			Welfare growth			Domestic price	AgGDP growth	
	Labor	Capital	Land	Total	TOT	TFP			Total
Ghana	0.63	0.87	0.36	1.86	0.58	1.97	2.57	12.8	17.8
Top performers	0.81	1.6	0.29	2.72	-0.35	3.36	3	7.75	14
Average performers	0.6	0.32	0.19	1.1	-0.72	1.68	0.95	7.47	9.56
Bottom performers	0.47	0.56	0.13	1.17	-0.18	0.31	0.12	4.29	5.46

Source: Nin-Pratt, A., M. Johnson, and B. Yu 2012. Improved Performance of Agriculture in Sub-Saharan Africa: Taking Off or Bouncing Back. IFPRI Discussion Paper, forthcoming.

plaining about 20 percent of AgGDP growth. Factors of production contribute with 15 percent of total growth, a small amount compared with their contribution in 1981–1990 (close to 66 percent). Comparing sub-periods, we observe that SSA’s worst performance occurred during the 1980s when growth was driven by labor and slowed by falling domestic prices. According to our results, SSA’s improved performance started in 1994. After this year, TFP shows an increasing trend with little fluctuation until the present.

The better performance of agriculture in recent years has extended to almost all SSA countries. This is good news, but it is also evidence that these countries have benefited from common regional and external factors that partly explain the observed growth. Table 2 presents the decomposition of AgGDP growth for SSA countries sorted in three groups: top performers, bottom performers, and average performers. Ghana is in the group of top performers with an average growth rate in nominal agricultural GDP of 17.8 percent.

Higher prices explain about 45 percent of the difference in AgGDP growth between top and bottom performers, while another 35 percent is explained by TFP. Prices are even more important in explaining differential growth between the average and bottom groups. About 80 percent of the difference in AgGDP growth between these two groups is explained by prices, while differential growth in TFP explains the remaining 20 percent.

POLICY CHANGES AND TFP GROWTH

Different factors with very different implications for future growth could be driving growth of agricultural TFP in SSA. The scenario with best prospects for future agricultural growth is one in which present TFP growth is mainly explained by technical change. In this situation, we observe adoption of new technolo-

gies with growing use of chemical inputs and increased land or labor productivity. Alternative explanations for TFP growth are not necessarily related to the process of technical change and the incorporation of new technologies. If growth is driven by increased technical efficiency rather than by technical change, changes could result from producers that are able to increase output using the same technology and resources they used in the past.

For example, efficiency gains could be the result of policy changes that generate incentives for producers to increase the area planted with some crops while reducing production of others, or to change the rela-

tive intensity in the use of inputs. This is a plausible story for SSA given the poor performance of agriculture in the past. We argue that the evidence so far shows that the most likely explanation for recent TFP growth is the policy change that occurred in the 1980s and 1990s. We present here some of this evidence and we discuss implications for future growth.¹

The strategy followed by African governments between 1965 and 1985 resulted in overvalued exchange rates, prolonged budget deficits, protectionist trade policies, and government monopolies that reduced competition. These practices negatively affected productivity and resulted in low prices for agricultural commodities because of taxation or high costs incurred by state enterprises. Reforms began in 1984/85, and by the end of the 1990s the combination of sustained reforms and financial assistance was associated with better economic performance.

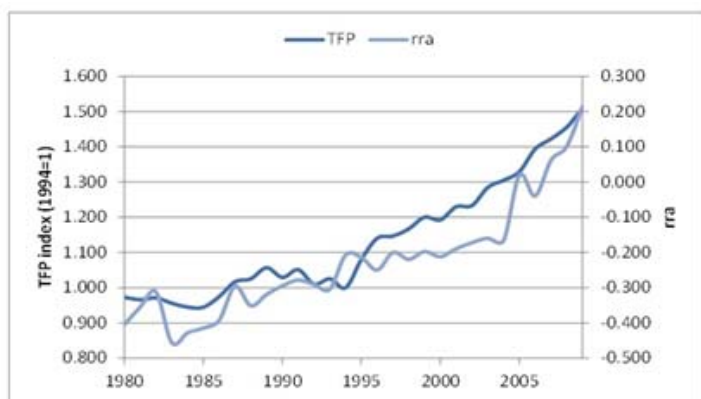
There is a clear coincidence between the period of policy changes and an improved performance of the regional economy (Figure 1). The trend of increasingly negative growth rates observed in the early 1980s reverts after 1983, while growth of imports and exports becomes positive after 1994, coinciding with the devaluation of the CFA in West Africa. The figure also shows a substantial change in the openness of SSA’s economies in the early 1990s after years of decline.

Figure 2 best illustrates this policy shift by comparing an average index measure of the rate of relative assistance (RRA) to agriculture with agricultural performance. Negative values of the index reflect unfavorable policies for agriculture, while values

¹ For discussion on evidence of technical change, see Nin-Pratt, Johnson, and Yu 2012, *Improved Performance of Agriculture in Sub-Saharan Africa: Taking Off or Bouncing Back*, IFPRI Discussion Paper, forthcoming.

greater than zero reflect policies that favor agriculture relative to other sectors. As evident from the figure, the index exhibits a high correlation with changes in agricultural TFP over time (0.94). Of a total of 14 countries for which information on *RRA* is available, 11 show correlations between *RRA* and TFP greater than 0.5, with Tanzania (0.86), Uganda (0.76), Ethiopia (0.75) and Ghana (0.72) showing the highest correlations.

FIGURE 2 - EVOLUTION OF AGRICULTURE VALUE ADDED IN SSA, 1980-2010



Note: $RRA = \frac{-(NRA_{agt})}{(1+NRA_{nonagt})} - 1$, where *NRA* is the nominal rate of assistance.

Source: Authors' calculations using data from World Bank (2012) and OECD Creditor Database (2012)

Given the evidence, a plausible explanation of observed TFP growth is that policy changes in the 1990s generated incentives for a more efficient allocation of land and labor across agricultural activities, resulting in increased productivity. If this is the case, we should observe changes in the structure of outputs during the years of policy adjustment. There is evidence supporting the hypothesis that at least in part, TFP growth in SSA results from a more efficient allocation of land and labor across agricultural activities. We look to these changes in more detail in the case of Ghana.

GHANA: TECHNICAL CHANGE NEEDED

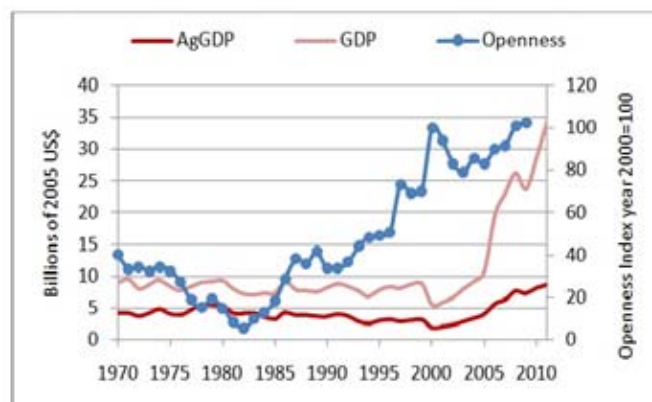
The experience of Ghana in the past 30 years is largely representative of SSA as a whole.² Gross economic mismanagement during the 1970s led to an exchange rate that was almost 1,000% overvalued, resulting in drastic drops of cocoa production, the main source of foreign exchange, while domestic industries were unable to operate due to lack of parts and intermediate inputs. With the collapse of trade in 1983, the government changed course, seeking assistance from the IMF and the World Bank.

²The description of policy changes in this section is extracted from Kraev 2004: *Towards adequate analysis and modeling of structural adjustment programs: an analytical framework with application to Ghana*, Ph.D. Dissertation, University of Maryland, College Park.

That was the start of the implementation of the reform package known in Ghana as the Economic Recovery Program (ERP). The package included a maxi-devaluation, fiscal austerity, tight money, and trade liberalization. Most structural reforms were concluded by 1991, so that the structure of the economy was comparatively stable during the 1990s.

The impact of policy changes in the economy were immediate and are well captured by the evolution of the openness index of Ghana's economy shown in Figure 3.

FIGURE 3 - GDP, AGGDP AND OPENNESS OF THE GHANAIAN ECONOMY



Source: Authors based on World Bank (2012)

Policy changes affected economic performance through three main channels:

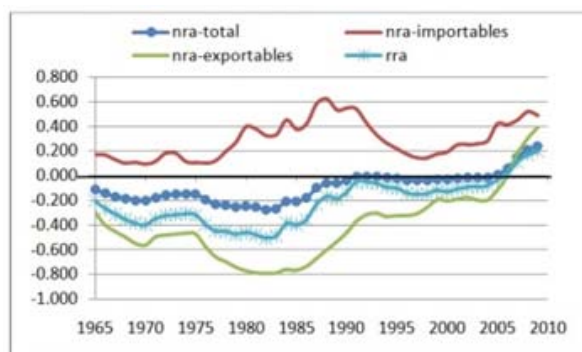
1. A major inflow of foreign aid released the acute foreign exchange strangulation that the country suffered in the beginning of the 1980s, allowing for extensive imports of capital goods and inputs.
2. The inflow of foreign aid also served to stimulate domestic demand through multiplier effects.
3. Devaluation of the cedi and higher producer prices offered to cocoa farmers together with other export promotion policies led to an increase in export supply.

These policy changes had a major impact in agriculture. The bias of policies in the 1970s and 1980s against export crops was reverted, improving competitiveness of cocoa in international markets and also domestically with respect to food crops. For example, devaluation of the cedi, improved current account policies and larger producer prices offered to cocoa farmers together with other export promotion policies, led to an increase in export supply.

Figure 4 shows the evolution of the nominal (*NRA*) and relative (*RRA*) rates of assistance for overall agriculture, and for importable and exportable agricultural commodities. The largest difference in protection between exportables and importables was reached in 1982 when *NRA* of importables was 0.451 and

that of exportables was -0.761. After that year, unfavorable policies for exportables were reverted and the gap between NRA values was reduced substantially.

FIGURE 4 - NRA AND RRA FOR AGRICULTURE AND RRA FOR EXPORTABLE AND IMPORTABLE AGRICULTURAL COMMODITIES



Source: Authors' calculations using data from World Bank (2012) and OECD Creditor Database (2012).

Note: $RRA = [(1+NRA_{ag}) / (1+NRA_{nonag})] - 1$, where NRA is the nominal rate of assistance.

The consequence of these policy changes was rapid growth of cocoa production through area expansion, and at the same time rapid growth of cereal imports. The share of cocoa in total area, which dropped from 50 percent to less than 30 percent between 1975 and 1995, increased to 40 percent by the end of the 2000s. Staple crops like maize, rice, millet, and sorghum on the other hand reduced their share in total area, while the area planted to cassava increased after the reform, reaching a ceiling in 1995 (Figure 5).

As policy changes and the inflow of foreign aid also served to stimulate domestic demand, a growing demand with constrained supply of food crops resulted in increased agricultural imports. Figure 6 shows the evolution of agricultural imports before and after the implementation of the structural adjustment program. It is clear from the figure that a growing economy has increased demand for imported food.

The bottom line is that in the case of Ghana, policy changes resulted in a shift in land allocation from cereals to cocoa and in

a minor degree to cassava, increasing sectoral productivity but without major changes in productivity of individual crops and activities.

CONCLUSION

Results from our analysis show both good and bad news for the future of African agriculture and for Ghana in particular.

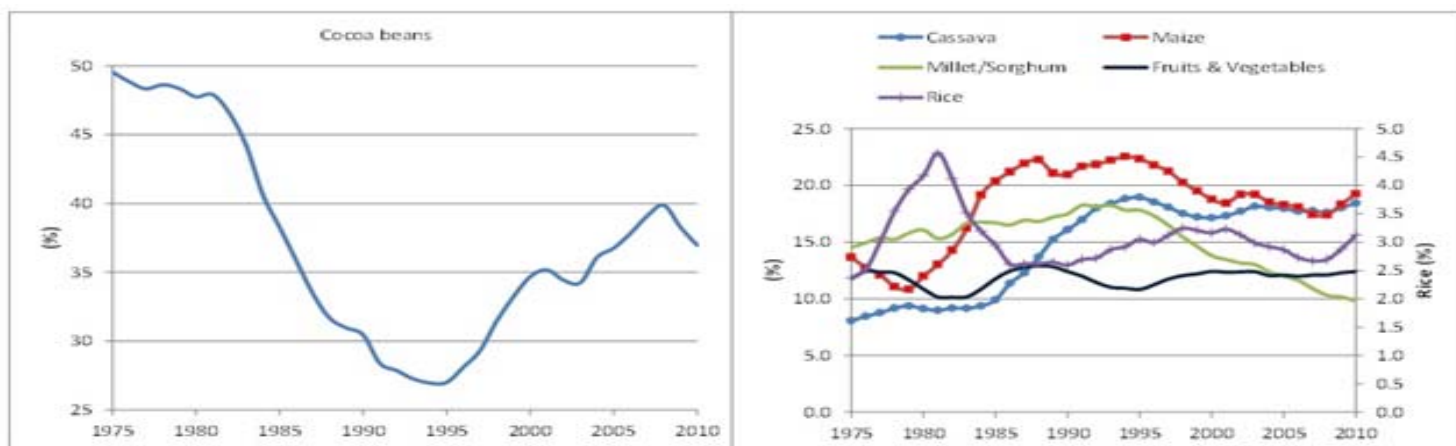
The good news is that there is clear evidence of a recovery of SSA's agriculture with sustained productivity growth in the most recent decade, which is no small achievement. A changing policy environment and increased attention to agriculture in the post-reform period has had a major effect on overall productivity growth based on technical efficiency gains.

increase demand for food imports because the relative loss in area allocated to food crops is not compensated by significant yield increases. As export supply cannot catch up with the import demand (no increase in cocoa productivity), the consequence of this process is a buildup of foreign debt and a surge in inflation from the demand stimulus.

Ghana will be threatened by balance of payments and budget deficits, which have been directly related in the past to constraints on exports and the growth of food imports resulting from periods of income growth. Without increasing productivity of cereals and export crops, the sustainability of the agricultural growth model in Ghana will be threatened by balance of payments and budget deficits, which have been directly related in the past to constraints on exports and the growth of food imports resulting from periods of income growth.

The bad news is that there is no evidence of significant contribution of technical change to TFP growth, which will be necessary to make growth sustainable. The importance of increasing productivity of export and staple crops to sustain growth is clear in the case of Ghana. Policy changes expanded exports through a shift in land and labor allocation from cereals to cocoa. However, economic growth increases demand, and because food crops are a very large component of aggregate demand in Ghana, incentives to expand exports.

FIGURE 5 - SHARING OF MAJOR CROPS IN TOTAL CROP AREA (%)



Source: Authors using data from FAO 2012.

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This publication has been prepared as an output of the Ghana Strategy Support Program, which is funded by USAID and facilitated by The International Water Management Institute (IWMI) headquarters. It has not been peer reviewed. Any opinions stated herein are those of the author(s) and do not necessarily reflect the policies of the International Food Policy Research Institute (www.ifpri.org), its partners, or its collaborators.

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