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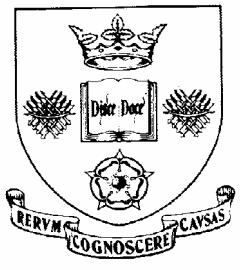

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The Role of the 1994-95 Coffee Boom in Uganda's Recovery

Lindsay Chant, Scott McDonald, Arjan Verschoor[1]

Abstract

This paper reports a CGE analysis that explores the consequences of the 1994-95 rise in the international price of coffee for Uganda's economy. Evidence is found for a small effect on medium-term growth and poverty reduction. Aid dependence is among the reasons why this effect is not found to be larger. Major beneficiary groups are not only the farmers to which the windfall initially accrued but also urban wage earners and the urban self-employed.

Keywords: Computable General Equilibrium, Coffee; Uganda; Dutch Disease.

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I. Introduction

Can a primary-commodity dependent economy ride the waves of cycles in world market prices in such a way that it eventually shakes off its vulnerability to external terms-of-trade shocks? As a rule, the answer to that question is, No. Slumps in world market prices tend to have a lasting negative effect on medium-term growth and poverty reduction, but booms do not have a lasting positive effect (Dehn, 2000). The reason for that, it is argued, is that windfall profits are not saved and invested. The small-scale private sector typically either does not receive a significant share of the rising border price, or does not have access to liquid assets other than cash to store assets while it's making its investment plans, whose value may be eroded at any time by unpredictable inflation. Windfall profits thus tend to be either consumed or taxed away. However, all such factors that tend to suppress the investment response to a commodity boom are susceptible to policy manipulation. Booms should have a lasting effect on growth and poverty reduction when an economy has been deregulated and stabilised. An interesting case study would therefore be a primary-commodity dependent economy that experiences a commodity boom after it has successfully undergone a Structural Adjustment Programme (SAP). That describes Uganda in the mid 1990s.

Decades of 'economic mismanagement' (to put it euphemistically) left a predatory and heavily regulated export sector in place, in the early 1990s, which for its earnings depended virtually exclusively on one commodity: coffee. A comprehensive package of reform measures achieved macroeconomic stability, privatised and deregulated the export sector, and encouraged better agronomic practices (Morrissey and Rudaheranwa, 1998, Henstridge and Kasekende, 2001). When coffee prices peaked in coffee season 1994/95, farmers decided to invest well over half of their windfall profit (Henstridge and Kasekende, 2001 p70), which is the rational response in an economic environment where a sufficiently large share of the border price accrues to farmers with well-diversified income sources, but which is by no means a typical response, precisely because these factors are often not in place. A temporary shock was thus converted into an increase in the stock of private capital, and Uganda's economy grew rapidly during the rest of the decade, possibly spurred by the coffee boom, a possibility we explore in the paper. GDP per capita (in constant 1995$) increased from 277 in 1994 to 348 in 2000, an annual growth rate of 4.16%; and over the same period the poverty headcount measure fell from 50.2% to 35.2%.[2] Moreover, whereas in coffee season 1994/95,

[2] Sources: World Development Indicators, CD ROM (2002) for GDP per capita; Appleton (2001b) for the poverty headcount measure.

coffee exports accounted for 64% of total export earnings, in 1999/00 this share had fallen to 14.1%, with total export earnings themselves 71% higher.[3] Uganda seems to have considerably widened its export base and escaped its exposure to fluctuations in the world market prices of a single commodity.

The Ugandan success story comprises a sequence that runs from policy reform through boom to structural transformation, growth and poverty reduction; it has been much commented upon (e.g., by various contributors to the volume edited by Collier and Reinikka 2001). Quite astonishing claims have been made about the role of the 'boom' element in the sequence, for example that it accounts for over half of Uganda's considerable fall in the poverty headcount measure during the decade.[4] But what if the 'boom' element is left out of the sequence? How much of Uganda's success story can in fact be attributed to the boom? By how much less would Uganda have grown, by how much less would poverty have been reduced and would the diversification of the economy have been hindered if the coffee boom had not taken place? These are important questions because if they are not answered, one cannot legitimately attribute any part of Uganda's economic success to the boom. Uganda is now held up as an example for others to emulate. It is said to be the exception to the rule that booms do not have lasting positive effects, and proof of the assertion that deregulating markets and stabilising the macro-economy encourages booms to have salutary medium-term impacts. But is it and does it? The only way in which one can hope to answer that question is by exploring the relevant counterfactuals, and by examining two sequences: one from policy reform to growth and poverty reduction with the boom inserted in the middle, the other with the boom left out.

In this paper we explore the consequences of the boom for the factors employed and household groups participating in the cash crop sector *as well as* the other major sectors of the Ugandan economy once so-called spending and resource movement effects have been included in the analysis. A background section describes the 1994-95 coffee price rise in terms of its direct consequences for coffee farmers, the conditions that prevailed in the

[3] Source: Uganda Coffee Development Authority (UCDA).

[4] Presentation by Paul Collier at an international conference held in Yamoussoukro, Côte d'Ivoire, from 5 to 9 November 2001, on the future of perennial crops with regard to investment and sustainability. The claim is a slightly stretched reading of Appleton (2001a, pp105-111), who quantifies, using Ravallion and Huppi's (1991) methodology, the contribution of each economic sector to Uganda's fall in headcount poverty between 1992 and 1995/96. The cash crop sector accounts for 50.8%, partly due to improved yields and partly due to the sharp rise in coffee prices in the intermediate years. His decomposition is based on household surveys, and the linkages between sectors he quantifies are limited to the movement of people between sectors, and are found to be small.

Ugandan economy at the time of the boom, and the reasons why Ugandan farmers felt they could invest a substantial part of the windfall profit. The model/data section briefly describes the recursive dynamic open economy CGE model used for the analysis and the structure of the economy two years before the boom. A section detailing experiment design describes how we assess the impact of the boom by comparing two scenarios: one that assumes the economy continued to grow on its pre-boom growth path and the other a counterfactual one in which the 1994-95 coffee price spike is imposed on the pre-boom baseline. The next-to-last section presents and discusses the results. It transpires that there is no legitimate evidence for attributing a major catalytic role to the coffee boom in Uganda's recovery during the 1990s, contrary to what has been claimed about it. Due to spending and resource movement effects, ultimate beneficiary groups are not the ones that initially benefited, but more importantly, the currency appreciation that the boom gave rise to had perverse public finance effects because of the government's huge dependence on foreign aid. The final section highlights implications for successful management of commodity booms. Details about the model, the SAM and the time series data used in the calibration are available from the authors.

II. Background and Context

A sharp but temporary increase in international coffee prices was triggered by a frost in Brazil in June 1994. Between the most recent trough in coffee season 1991/92 and the peak of the boom in 1994/95, the price in US$ that exporters in Uganda's capital Kampala received increased by 211%, from $0.83 per kilo to $2.58 per kilo. The farm gate price in nominal terms increased even more, from 359 Ugandan Shillings (UGS) per kilo to 1,732UGS per kilo, an increase of 382%. The reason that this figure greatly exceeds 211% is that the share of the border price that accrues to farmers rose over the same period because of increased competition among exporters for coffee purchases; we return to this point below. The farm gate price in real terms (the one relevant for our simulations) rose from 359UGS to 976UGS, or by 172%. For details on the calculations behind the claims made in this paragraph see Appendix 1.

Uganda's export earnings were heavily dependent on coffee at the time of the boom. In coffee season 1993/94, coffee's contribution to total exports was 51.2%, and in 1994/95 63.8% (World Bank, 2002), a figure which may well be an underestimate because, due to widespread evasion of the windfall tax (see below), not all exports were recorded in the official statistics. The reasons for the Ugandan export sector's dependence on coffee are historical. At the time of independence in 1962, the government pursued a strategy of

promoting export diversification, with a prominent role for manufactures (Wood and Jordan, 2000). However, despite a relatively low risk of civil conflict as calculated by formal models (Collier and Reinikka, 2001, p17), conflict came nonetheless in the form of Amin and Mobote's respective reigns of terror. The consequences for the economy were devastating: erratic and inconsistent policy management, a sharp fall in real farm returns, and a strong anti-export bias (WTO, 1995). Coffee exports alone survived because the bushes could endure neglect (Wood and Jordan, 2000, p8). When the reform-minded National Resistance Movement (NRM) came to power in 1986, it inherited that situation. Primary-commodity dependence plus a narrow export base left the Ugandan export sector at the mercy, in the medium run, to commodity price swings (Deaton and Laroque, 1992, Cashin *et al*., 2000) and in the long run to deteriorating terms of trade (Grilli and Yang, 1988). Moreover, as commodity dependence goes, robusta coffee is arguably the worst commodity to be dependent upon[5]: the maximum amplitude of the robusta price cycle is larger than that of almost any other commodity, and the proportion of time spent in a slump of the total duration of the commodity price cycle is 71% on average, higher than for any other commodity, roughly equal to 54 months (Cashin *et al*., 2002).

Of Uganda's population of 16 million at the time of the onset of the boom in 1994 (grown to 22 million in 2002), 1.8 million people (364 thousand farm households) were directly involved in coffee growing (World Bank 2002). Even though only one in six coffee farmers hire some labour, the estimated number of people that derive *some* income from coffee has been put at 5 million for 2000 (Ibid.), from which we estimate a number of 3.6 million in 1994. This probably overstates the importance to livelihoods at any given point in time: in 1992/93 coffee growing accounted for only around 3 to 4 percent of total crop agricultural revenue (World Bank 1996). However, because it is Uganda's main cash crop, its dynamic importance, in the sense of its enabling farmers to accumulate financial assets that may be converted into physical assets, is paramount.

The coffee boom, when it came, thus had a potentially huge destabilising effect on the exchange rate (considering coffee's share in export earnings), while at the same time offering huge potential for medium-term growth and poverty reduction (considering the number of people whose livelihoods partly depend on coffee and the role savings from coffee earnings tend to play in financing private investment). Although there is evidence that the coffee boom

[5] Most of the coffee Ugandans grow is of the robusta variety, although some of the more lucrative aribaca variety, which requires for its growth a height of between 1,200 and 1,800 metres above sea level, is grown on Mount Elgon, situated on the border with Kenya.

did lead to a real appreciation of the exchange rate, the magnitude of the appreciation was not dangerous, at least not for macro-economic stability (Morrissey and Rudaheranwa, 1998).[6] A windfall tax, hotly debated at the time and instituted in part in order to avoid that danger, with the benefit of hindsight turned out not to be necessary; and at any rate collections were small as a share of total coffee export earnings[7] and largely incident on exporters (Ibid.), therefore not affecting farmers' incentives to invest.

There are at least three reasons why Ugandan coffee farmers decided to invest a substantial part of the windfall profit, which, to a predictably temporary gain, is the rational response.

1. The government's credible commitment to low inflation (cf. Henstridge and Kasekende, 2001, pp56-8). Precipitated by a fiscal crisis, Uganda achieved in 1992 the macroeconomic stability that the IMF and the World Bank had urged it to secure since 1987. New techniques of monitoring expenditures helped tighten fiscal discipline, as a result of which the large budget deficits financed by monetary expansion became a thing of the past. President Museweni who (especially at the time) had a huge standing in rural areas declared, "There will be no more inflation. Inflation is indiscipline."[8] Ugandan farmers, who do not tend to live within easy reach of their nearest bank, and whose only realistic financial asset is domestic currency, had seen, when the boom came, a couple of years of low inflation, had heard a president they trusted declare that those inflation figures were here to stay, and therefore felt that they could accumulate Ugandan shillings whilst making their investment plans and until their financial assets reached the level required for conversion into the physical assets of their choice.
2. Deregulation of the export sector (cf. Morrissey and Rudaheranwa, 1998, p17). The NRM government inherited from Amin and Mobote an export sector in which parastatals ruled supreme, whose function was essentially to fuel the government's need of foreign exchange by buying coffee for export at administered prices, rarely adjusted for inflation. Encouraged by World Bank conditionality, the Coffee Marketing Board was privatised and other private

[6] We will see in Section V that the exchange rate played an important part in most of the mechanisms by which the direct effects of the boom were either dissipated or diverted.
[7] 3.5% in coffee season 1994/95 and 3.4% in 1995/96 (source: authors' calculations from figures in Henstridge and Kasekende, 2001, and World Bank, 2002).
[8] Quoted in ibid. p58.

exporters, including multinationals, were allowed to enter the market. As a result, the share of the border price accruing to farmers, only 18% in coffee season 1990/91, shot up and within a couple of years reached a level of 77%, and fluctuated between 70 and 80% thereafter (see Appendix 1). Naturally, the incentives to invest for coffee farmers were therefore much higher at the time of the coffee boom than they had been previously.

3. Improved agronomic practices encouraged by public spending on agricultural extension services, as a result of which yields and total output rose considerably (cf. Morrissey and Rudaheranwa, 1998, p15).

The combined effect of these three factors – all three of them policy-induced – was that the ability to accumulate financial assets (ad 1) was matched by a greater return on capital (ad 2 and 3).

The dependence on coffee could have been Uganda's undoing, the NRM's admirable commitment to reform notwithstanding, if coffee price movements had gone differently. However, the coffee boom, the fortuitous timing of which could not have been foreseen, rewarded the reform measures implemented in the early 1990s and secured a healthy return on them. This suggests that the boom may well have been the catalytic variable for spurring Uganda's remarkable growth and poverty reduction in the 1990s; a possibility we explore in the simulations below. As a corollary to the growth process the structure of exports became more diversified, with coffee's share in export earnings in 1999/00 amounting only to 14.1% of a much wider export base than the one in place in the early 1990s (Appendix 1). For that reason, when coffee prices plummeted towards the end of the decade, the Ugandan economy had left behind its previous extreme vulnerability to adverse price movements of a single commodity, and may therefore have escaped the ramifications these would have had earlier in the decade.

III. Data and Model

Data

The data used for this study are primarily derived from the Social Accounting Matrix (SAM) of Uganda for 1992 (Blake *et al*., 2000). The SAM as provided required adjustments to produce a SAM with separate commodity and activity accounts, and a number of other adjustments were undertaken to remove apparent anomalies (see Appendix 2). There are a

number of concerns with the SAM, over and above the reservations expressed by Blake *et al.*, (2000). In particular,

i) no transfers to or from the rest of the world to domestic institutions are recorded, e.g., remittances to/from households, unrequited transfers to the government (aid), etc.;

ii) the base table appears as if it might be a Use/Absorption matrix rather than a symmetric input-output table;[9]

iii) there is no account for land as a factor of production.

The SAM used to calibrate the model is called 'Final SAM', for which the Transfer accounts were eliminated by defining transfers as net and attributing net transfers to a government expenditure account. The final SAM has 128 accounts; of which 50 are commodity accounts; 50 are activity accounts; 7 are factor accounts; 10 are household accounts; 6 are government accounts; 2 are capital accounts; and the remaining 3 accounts are the Government account, the Enterprise account, and the Rest of the World account.

Table 1 A 'Macro' SAM for Uganda 1992 (Uganda Shillings, Millions)

	Commodities	Activities	Factors	Households	Government	Capital	Rest of the World
Commodities	0	1,421,360	0	3,322,335	311,208	552,621	242,383
Activities	4,961,896	0	0	0	0	0	0
Factors	0	3,480,929	0	0	0	0	0
Households	0	0	3,480,929	0	410,437	0	0
Government	137,552	59,608	0	21,853	0	0	171,164
Capital	0	0	0	547,177	-331,467	0	336,910
Rest of the World	750,458	0	0	0	0	0	0
Totals	5,849,906	4,961,896	3,480,929	3,891,366	390,177	552,621	750,458

Source: Model database.

An indication of the main structure of the economy can be gathered from the macro SAM that is derived from the Final SAM and is reported in Table 1. Certain features deserve a brief mention. The economy is open with respect to imports as 12.8% of commodities supplied are imported, but fairly closed with respect to exports as only 4.1% of demand emanates from the rest of the world.[10]

Intermediate inputs account for 28.6% of activity inputs with primary factors accounting for 70.2%. In addition to intermediate inputs' and exports' demand for goods,

[9] This is common with so-called 'input-output' tables in many countries.
[10] The difference between imports and exports is largely financed by foreign aid inflows.

households provide 56.8% of total commodity demand; investment provides 9.4%, and the government 5.3%.

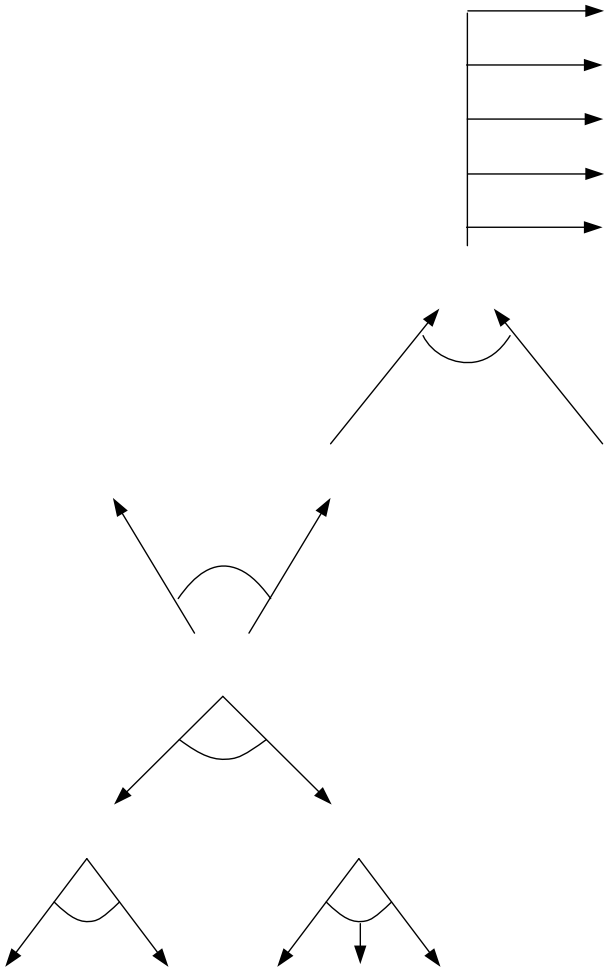
Government income comes from two sources: tax revenue (56.1%) and foreign aid payments (43.9%). Tax revenue is generated via 3 tax instruments; import tax, production tax, and household income tax. The most important of these taxes in terms of government income is the import tax, which provides 62.8% of total tax revenue and 35.3% of total government income. Producer tax is the second largest contributor of tax revenue, providing 15.3% of government income. Household income tax provides 5.6% of government income. This analysis of the structure of government income shows a high dependency on aid and import taxes. The government is running a budget deficit during this period and the economy is a net borrower from the rest of the world.

Model

The CGE model is developed from the Sheffield Standard Model 3 (McDonald, 2004). The model is in the general class of neoclassical models. The modelling of production relations and factor demands allows for imperfect substitutability between factors, i.e. capital for labour, and between different types of labour. The mapping of factor income to households ensures that changes in production activities are reflected in changes in household income levels.

The quantity flows for the model are shown in Figure 1. The flow of commodities through the model relies upon the Armington assumption that allows for imperfect substitutability between goods (Armington, 1969). Activities choose the quantities of commodities to produce according to relative prices and the ease of substitutability allowed for within the Constant Elasticity of Substitution (CES) functions so as to maximise profits. Domestically produced goods are sold either on the domestic or foreign markets with the proportion being determined by the relative sale prices and the ease of transformation specified in the Constant Elasticity of Transformation (CET) functions. Finally, domestically produced commodities are combined with imported goods to form a composite good that goes to satisfy domestic demand. The proportions of domestic and foreign goods in the composite commodity are again dependent on relative prices and the ease of substitution specified in the CES functions.

Figure 1 Quantity Flows



There are six tax instruments in the model, but only three tax account transactions are reported in the SAM; import taxes act as a wedge between the world price of imports and the domestic price of imports, producer taxes along with the value of intermediate goods are a wedge between the producer price of activity output and the valued added price, and household taxes form a wedge between household incomes and expenditures.

Capital stock growth is determined endogenously in the model through the savings behaviour of agents. All agents are assumed to invest their savings at the end of each year in the purchase of capital. This capital increases the total capital stock and therefore also the supply of capital available to the economy. The newly accrued capital will also provide an extra income stream to its owners in future periods. Households and the rest of the world save in each period and the government dissaves; hence whilst households and the rest of the world are accumulating capital, the government is running down its capital stock in order to finance current period consumption and transfer payments to households.

IV. Experiments and Closure Rules

The following two scenarios are used to analyse the impact of the coffee price boom on the economy of Uganda.

Scenario 1: No boom in coffee prices

This scenario contains a set of experiments used to simulate the state of the economy in the absence of a boom in the price of coffee, thereby providing a base to which the boom scenario results can be compared.

Key features of scenario 1 include:

- technical change consistent with a 1% yearly growth rate of per capita GDP[11];
- exogenous labour supply growth of 2.65% per annum; and
- endogenous capital stock growth.

The growth rates for per capita GDP and the supply of labour were estimated econometrically for the period 1983-1992 using a log-linear regression. While usable data were available for the period 1983 to 2000, it was necessary to omit the 1992-2000 from the estimation of the growth rates, because it contained the effects of the coffee price boom, which means that the time series available for benchmarking forecasts for the macroeconomic variables was shorter than desirable.

Scenario 2: Boom in coffee prices

The aim of the analysis is to assess the impact of the coffee price boom on the economy of Uganda; hence scenario 2 adopts the same values for technical change and labour supply growth whilst the increases in the export price of coffee are introduced. The capital stock continues to be endogenously determined.

Coffee Prices

Figure 2 shows Ugandan coffee export prices (US$/kg) from 1992-2000.[12] As the model has a base year of 1992, the exogenous changes in the export price of coffee are specified as percentage changes from the base year. Figure 3 charts this series. Note that the coffee export price in 2000 is below that of the 1992 level. In scenario 2 coffee prices from 2000 onwards

[11] The technical change parameter is calibrated by specifying the rate of growth in per capita GDP and labour supply growth and running the model to solve for the associated values of the shift parameter on the production function. These values can then be fed exogenously into the model to drive growth and GDP released to be endogenously determined.

[12] See Appendix 1 for details on the derivation of these figures.

take the 1999 value. Modelling coffee prices in this way ensures that the longer-term effects of the boom can be captured without the potentially obscuring effects of the coffee price fall of the late 1990s.

Figure 2 Coffee Export Prices

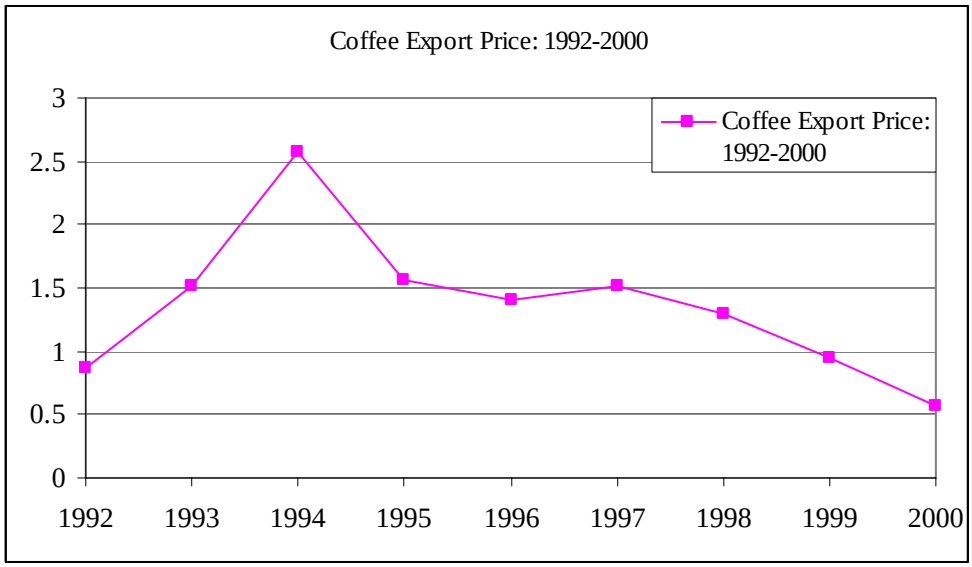
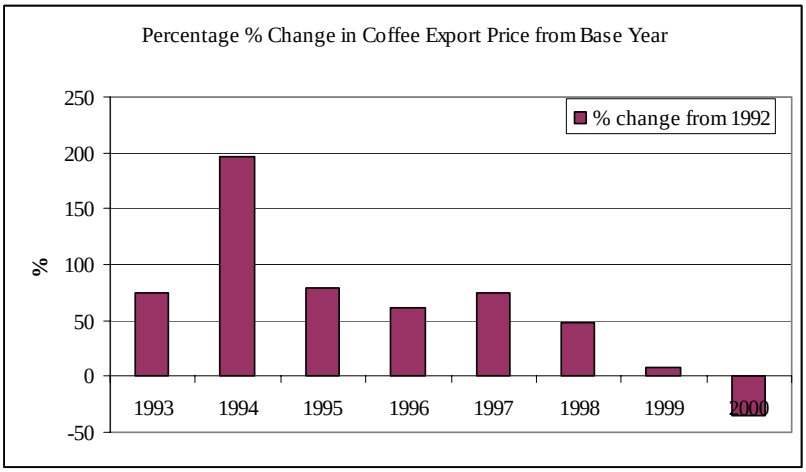


Figure 3 Year on year changes in coffee export prices



Model Closure Rules

The following 'closure' rules were implemented to close the Ugandan model:

Foreign Market Closure

- The current account balance is fixed at the 1992 level
- Floating exchange rate to ensure the trade balance clears
- Uganda is assumed to be a price taker on all world markets.

Capital Account Closure

- Balanced macroeconomic closure: the share of investment in final demand is fixed

Government Account Closure

- The government deficit is fixed at the 1992 level
- Balanced macroeconomic closure: Fixed value share of government consumption in final demand
- Fixed government transfers to households and enterprises
- The indirect (production) tax rate and household income tax rates are free to adjust equiproportionately to ensure that the government account clears.

Factor Market Closure

- Capital is fully employed and fully mobile. Sectoral price differences for capital remain fixed whilst the average price of capital is free to adjust to ensure that the capital market clears. The supply of capital increases at an endogenously determined rate as agents invest their savings in the accumulation of capital.
- Waged labour[13] is fully employed and fully mobile. Sectoral wage differences remain fixed whilst the average wage rate of labour is free to adjust to ensure that the waged labour market clears. The supply of waged labour increases at the exogenously determined rate of 2.65%.
- Non-waged labour[14] is fully employed and fully mobile. Sectoral wage differences remain fixed whilst the average wage rate of capital is free to adjust to ensure that the non-waged labour market clears. The supply of non-waged labour increases at the exogenously determined rate of 2.65%.

Numéraire

- Fixed Consumer Price Index

These closure rules are selected to reflect the structure of the economy of Uganda during the 1990s. Structural Adjustment Programmes faced by the country required that government and current account deficits must not worsen. The country was operating a floating exchange rate regime during this period.

[13] Waged labour is further disaggregated into three skill-based groups: low literacy, medium literacy and high literacy waged labour.

[14] Non-waged labour is further disaggregated into three skill-based groups: low literacy, medium literacy and high literacy non-waged labour.

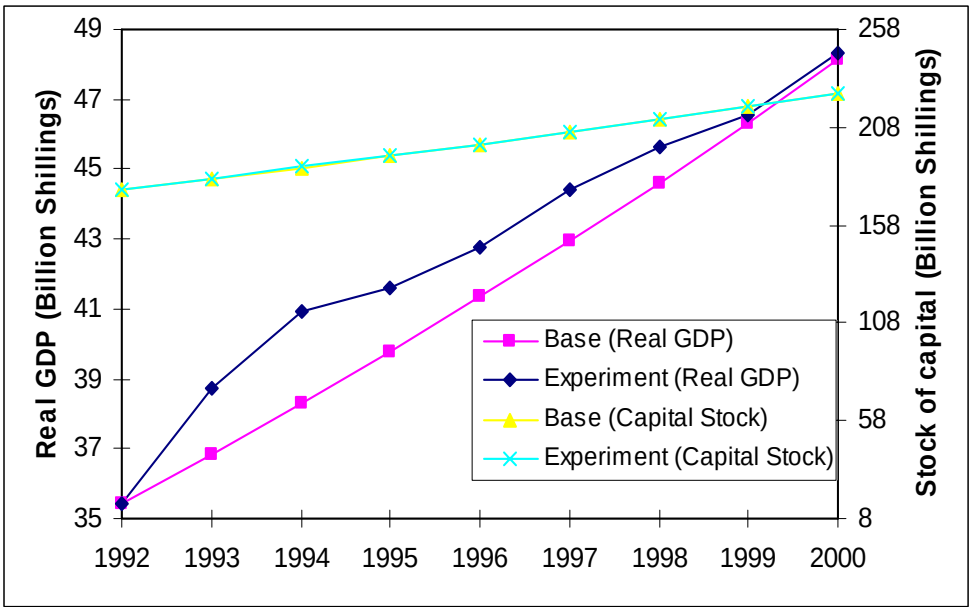
V. Results

Figure 4 plots the boom and baseline results for real GDP and the capital stock. During the boom years, there is an appreciable effect on GDP (about 7% at its highest in 1994), but only a small amount of this remains (less than 1%) when coffee prices have returned to their pre-boom level from 1999 onwards. The reason that hardly any medium-term real income growth persists is that the growth of the capital stock is virtually identical for the boom and the baseline scenario. This finding is directly opposed to the salutary effects that have been attributed to the Ugandan coffee boom. Understanding why this is so in our model may reveal factors that prevent commodity booms from having lasting effects on economic growth in reality (Dehn, 2000). Our results suggest an explanation along the following lines.

The internal balance and the external balance are fixed at 1992 levels by the model closure rules. As noted above, this is a realistic assumption because Uganda obeyed faithfully from the early 1990s onwards the SAP conditions for macro-economic stability imposed on it by the IMF and the World Bank. These fixed balances have two important effects. First, with savings from abroad and from the government fixed, extra savings can only come from households. Second, the floating exchange rate will have to absorb all of the external shock and therefore plays an important part as an equilibrating variable. We will next show how these two effects combined, and given the government's huge dependence on foreign-denominated aid money to finance its budget, helps explain why investment responded as little as it did to the windfall profits that the coffee boom gave rise to.

As expected, the exchange rate appreciates sharply during the boom years in the boom as compared to the baseline scenario: by as much as 68% in 1994 and between 33 and 46% in each of the other boom years. In the base scenario, 55% of the government's budget is financed by foreign aid in every year. In the boom scenario, the value in UGS of foreign-denominated aid money falls by the same proportion as the exchange rate appreciates. With the government deficit fixed, this calls for tax rises. Household income taxes are indeed between 20 and 60% higher during the boom years in the boom scenario. Naturally, disposable income is correspondingly lower and households save less than they otherwise would have done.

Figure 4 Consequences for economic growth



Source: Model simulations

As noted, households are the only institution that can save more in the boom than in the base scenario. Their extra savings barely register as additions to the economy's capital stock. As a result, we do not find much of a medium-term effect of the coffee boom on real GDP. It would have been higher, had the government not needed to raise taxes as an indirect consequence of the boom. The analysis thus suggests important mechanisms through which economies that are not only commodity-dependent but also aid-dependent, such as Uganda, are prevented from benefiting fully from a commodity boom. The ensuing currency appreciation erodes the value of a given amount of foreign aid, and thereby increases the need for higher taxes, which in their turn reduce the scope for private sector investment and savings.

Aggregate welfare as measured by real GDP is thus appreciably higher in the short run but only marginally higher in the medium run in the boom scenario. What about the distribution of welfare gains? Table 2 presents this distribution by household group. Our measure of household welfare is expenditure-based and reflects both changes in relative prices and changes in preferences when income changes.[15] Results are presented for 1994 and 2000 only, as results for respectively the other boom and non-boom years are very similar.

[15] Specifically, consumption functions take a Stone-Geary form in which certain commodities satisfy subsistence demand and take priority over others that satisfy discretionary demand.

Table 2 Distribution of welfare gains (%) by major household groups

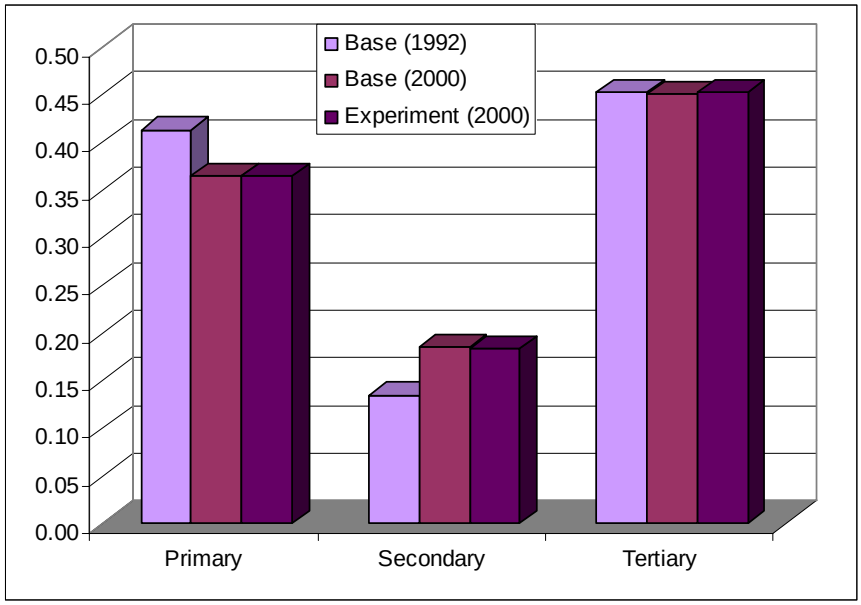
	1994		2000	
Urban	**52.5**		**32.7**	
Waged	22.7		14.3	
Self-employed	24.8		18.4	
Unemployed	5.0		2.0	
Rural	**47.5**		**67.3**	
Farm	43.2		53.0	
Self-employed		34.0		48.9
Waged		9.2		4.1
Non-farm and unemployed	4.3		14.3	
Total	**100**		**100**	

Source: Model simulations
Background information to the table:
1) The welfare measure is a Equivalent Variations measure and is computed using relative price movements of the commodities that make up households' commodity baskets. Weights on commodities change over time in line with marginal budget shares from a Stone-Geary function.
2) Welfare gains are computed as the Equivalent Variations measure of the boom simulation minus that of the baseline simulation. In 1994 total welfare gains equal 1.41 billion UGS (baseline GDP 40.91 billion UGS) and in 2000, 0.49 billion UGS (baseline GDP 48.31 billion UGS).

The most remarkable feature of these results is that, during the boom years, urban groups benefit as much as rural groups: they both usurp about half of the addition to aggregate welfare (7 percent in 1994). The per capita effect for urban groups is of course much higher than for rural groups. The reason that urban groups benefit as much as they do is a Dutch Disease effect. The demand for manufactures (which could be considered as non-tradable in Uganda[16]), construction and public services rises in the short run as a result of the spending effect of the boom. As a result, their value added price rises in terms of that of the tradable sector, which is of course the real appreciation part of Dutch Disease. Moreover, these sectors benefit more than others from the currency appreciation discussed above. They rely more than other sectors on imported intermediate inputs (arms in the case of public services!), which have now become much cheaper. Factors relocate and major beneficiaries in the first instance are the urban waged. These then spend their extra income and – as a whole though not of course per capita – the much larger urban informal sector benefits slightly more than the urban waged do from such second-round spending effects and associated relative price movements. After the boom, there is not much extra welfare left to be distributed, and the distribution of that has shifted back in favour of the rural groups.

[16] The treatment of the manufactures sector as non-tradable rather than as the lagging tradable sector is unorthodox but entirely appropriate in the present context. See Wood and Jordan (2000) for an exposition of the complex of factors that explains why Uganda does not export any of its manufactures, whereas other African countries with similar per capita income manage to do so successfully.

Figure 5 Consequences for sectors



Source: Model simulations

Contrary to the claims that have been made about it, we thus do not find that there is much of a medium-term effect on growth from the boom, or that major beneficiaries from the boom are the farmers to which the windfall profits initially accrued. The one claim that we have not yet investigated is that the coffee boom has been a catalytic variable for speeding up the structural transformation of the Ugandan economy. Figure 5 reveals nothing of the sort. The manufacturing sector has grown at almost precisely the same rate between 1992 and 2000 in the boom and baseline scenarios. In our model, this results from an Engels' effect on consumption – that is, away from subsistence towards higher-order needs when income rises. Note also that none of the short-run Dutch Disease effects on the growth of the manufactures' sector, commented on above, persists in the medium run.

VI. Concluding Comments

The purpose of the paper has been twofold. First, we have tried to examine the hypothesis, which is strongly suggested by the literature that provides an analytical description of the Ugandan economy's experience throughout the 1990s (summarised in Section II), that the 1994-95 boom may have been a major catalytic variable in triggering its remarkable economic growth by rewarding, because of its fortuitous timing, the reform measures undertaken in the immediately preceding years. We find that some of the initial growth indeed 'sticks', but do not find evidence that might warrant any claim that Uganda's economic performance should be largely attributed to the coffee boom. Of course, the limitations of the methods used must be borne in mind, and our point estimates of the size of the impact should not be taken at face

value; but the relative size of the impact of the boom on GDP in 2000 compared to that in the years immediately following the boom does not suggest that any multiplier effect has been at work that would justify calling the boom a 'major catalytic variable'.

Second, we have tried to evaluate the claim that the coffee boom has been responsible for a substantial part of Uganda's equally remarkable success in reducing the poverty headcount measure. As we noted in Section 1, footnote 4, this claim is based on an accounting methodology that has quantified the initial effect of the boom in terms of raising coffee growers' incomes. In evaluating such a claim, a CGE methodology comes into its own. By including spending and resource movement effects in the analysis, we have been able to establish that urban groups benefited as much as rural groups from the boom, with farmers benefiting only modestly. In the medium term, no household group benefits substantially.

A literature is starting to emerge that identifies the complex of factors that may enable a primary commodity-dependent economy to convert commodity price booms through the use of assets into medium-term impact on growth and poverty reduction. The paper points to a direction of research that adds to the complexity but seems essential in order to understand under what conditions such impact would actually materialise, and who its beneficiaries might be. The Ugandan government, through its structural reform of the economy, provided a climate that encouraged coffee growers to invest a substantial part of the windfall profits that the coffee boom gave rise to. However, its SAP commitment to not let the current account deficit and its budget deficit worsen, combined with its huge dependence on foreign aid, means that domestic taxation is linked directly to movements of the exchange rate. Since a commodity boom, *ceteris paribus*, increases the demand for domestic currency, (with the current account deficit fixed) the exchange rate appreciates, the purchasing power of foreign aid decreases, and (with the budget deficit fixed) taxes will rise. Governments of primary-commodity dependent economies who finance part of their budget with foreign aid and are strictly committed to macro-economic stability are therefore fated to tax away part of the windfall profit that a boom gives rise to, and therefore suppress an investment response, unless SAP conditions are relaxed or donors adhere to a financing rule that maintains recipient purchasing power of their aid disbursements.

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Appendix 1 Coffee Prices and Exports during the 1990s

1 Coffee season	2 Coffee export price in US$/kg	3 Exchange rate (UGS per one US$)	4 Producer share of border price (%)	5 Farm-gate price (UGS)	6 Price index	7 Farm-gate price (1991/92 prices)	8 Coffee exports (thousands 60 kg bags)	9 Coffee exports (millions US$)	10 Total exports (millions US$)
1990/91	0.97		18				2,085	121.3	363.5
1991/92	0.83	960.87	45	359	100	359	2,030	101.4	419.8
1992/93	0.87	1201.82	52	544	152.4	357	2,088	108.9	401.1
1993/94	1.52	1102.72	77	1,291	161.7	798	3,005	273.7	527.7
1994/95	2.58	932.51	72	1,732	177.4	976	2,792*	432.7*	678.7*
1995/96	1.56	1012.81	78	1,232	192.6	640	4,147*	388.9*	863.5*
1996/97	1.40	1058.08	77	1,141	206.5	553	4,237	355.1	1118.2
1997/98	1.52	1149.65	75	1,311	220.8	594	3,032	276.4	951.5
1998/99							3,647	383.6	1265.5
1999/00							2,917	164.7	1165.2

Notes and data sources:
Column 2 – Uganda Coffee Development Authority (UCDA)
Column 3 – Bank of Uganda
Column 4 – World Bank (2002 p13)
Column 5 – Column 2 * Column 3 * Column 4 / 100
Column 6 – Based on annual consumer price index (WDI CD-ROM 2002)
Column 7 – Column 5 / (Column 6 / 100)
Columns 8, 9, and 10 – UCDA (* indicates likely underreporting due to evasion of the windfall tax)

Appendix 2 SAM Modifications

The SAM as provided required adjustments to produce a SAM with separate commodity and activity accounts, and a number of other adjustments were undertaken to remove apparent anomalies. Specifically,

i) the foreign exchange payments to government were redefined as the deficit of in the capital account, i.e., income to the capital account (savings) from the rest of the world);

ii) expenditure on stocks by the government were redefined as income to the stock change account from the capital account;

iii) total income to the capital account was defined as equal to total investment expenditure plus the value of stock changes;

iv) government savings were defined as the balancing item for the capital account.

There are a number of concerns with the SAM, over and above the reservations expressed by Blake *et al*., (2000). In particular,

i) no transfers to or from the rest of the world to domestic institutions are recorded, e.g., remittances to/from households, unrequited transfers to the government (aid), etc.;

ii) the base table appears as if it might be a Use/Absorption matrix, rather than a symmetric input-output table[17];

iii) there is no account for land as a factor of production.

There are marginal account imbalances in the 'Simple SAM', but the percentage differences only arise at the sixth decimal place. Rounding the SAM to 3 decimal places and making the required balancing adjustments manually removed the imbalances.

As there are no aid payments in the new SAM, an assumption is made in the model to allocate 55% of government income as aid. This is reflected in the SAM in Table 1.

[17] This is common with so-called 'input-output' tables in many countries.