

STRUCTURAL ADJUSTMENT POLICIES
IN GHANA IN THE 1990S

AN EMPIRICAL ANALYSIS
AND POLICY RECOMMENDATIONS

UNDP DISCUSSION PAPER

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1 Introduction

In the 1980s, Ghana undertook a radical reform program that largely followed the standard Structural Adjustment blueprint, including elimination of subsidies, opening to trade and capital flows, floating the exchange rate, and combating inflation with high interest rates. Initially, this was accompanied by high foreign exchange inflows (both grants and loans), and the combination resulted in high GDP growth, in particular in the export sector, as well as an accumulation of a large external debt. In the 1990s, the growth rate of the economy diminished, capital formation remained low, current account deficits persisted, and a high inflation rate was combined with periods of “freely falling” exchange rates.

The question of whether the stagnating state of the economy in the 1990s happened because of particular features of the structural adjustment program (such as excess fiscal austerity and high interest rates), or because the latter was not followed consistently enough (meaning mainly too high government deficits), is far from being settled. Based on the discussion of the literature, we formulate a number of specific policy-relevant hypotheses that we attempt to resolve by empirical investigation of time series data for the period 1990-2001.

How does one go about assessing the impact of a complex policy package, such as structural adjustment? The first choice one has to make is the level of aggregation one works on, namely macro, sectoral, or micro.

Macro policies concern variables that pertain to the economy as a whole, such as money supply, GDP, inflation, or the exchange rate. The causal connections between these are quite contested. However, typically, comparatively good monthly data is available on most of these variables, so that at least in principle, the disagreements as to the likely macro impacts of a given policy can be settled by running the appropriate econometric regressions. Unfortunately, these aggregate numbers, as important as they are, can tell us very little about how a particular region, productive sector, or population group is affected.

The next disaggregation level is sectoral, where an economy is decomposed into several productive sectors, each of which is considered separately. On this level, normally only yearly time series are available, and the precision of some of the estimates is quite low. However, many more stories can be told at this level. Does a given policy imply a trade-off between cocoa farmers and food farmers? Does agriculture behave differently from industry? Answering such questions is essential to understanding a country’s economy, which in turn is a necessary condition for rational policy evaluation and design.

If even that is not fine-grained enough, one has to consider the micro level, that is the description of individual persons or households. Data availability is generally the worst at this level, with virtually the only sources being household surveys. These are often conducted at irregular intervals, only describe a small (though possibly fairly representative) sample of the population, and rely on the truthfulness of respondents. However, micro investigations promise to do something that sector-level research cannot do, namely a better understanding of income distribution patterns and thus detailed poverty impacts of a given set of policies.

Each of these levels of aggregation has its own questions and techniques, and there is to date no method to work at all of them simultaneously. In our case, what is the optimal level of aggregation?

As structural adjustment policies are mainly designed to achieve macro impacts, and their actual macro impacts are hotly contested (Do structural adjustment policies have an excessive recessionary bias? Do they lead to macroeconomic recovery or demand strangulation?), we have to include a large macro component. For example, as long as one of the overriding targets of macro policy is inflation control, we have to understand how inflation actually works in Ghana if we want to evaluate the macro policies in question.

However, as our main interest is in poverty implications of structural adjustment, macro results are not enough. Thus, we extend our macro efforts with sectoral-level questions, allowing us to understand how incomes of different broad occupational groups are affected. Unfortunately, it is at present not feasible to span all three aggregation levels at once, so the extrapolation of sectoral results onto the micro level has to be left for future work.

The second choice a research project such as ours has to make is choice of method. The customary

methodology for macro investigations is econometric regressions; it is powerful, versatile, and well understood and accepted. Thus in our investigation of macro variables such as inflation, we use the ARIMA-X (Autoregressive Integrated Moving Average with eXogenous variables) technique.

ARIMA-X investigation of monthly time series shows that inflation can be quite well predicted from broad money supply growth, fuel price inflation, and wholesale food crop price inflation, while exchange rate depreciation, interest rates, and GDP growth were not significant. Broad money supply growth is in turn explained by exchange rate depreciation, CPI inflation and growth rate of the monetary base. The coefficient of interest rates is significant but so small as to make interest rates virtually useless in practice as a means of controlling money supply growth.

A less trivial decision is choice of method for sectoral-level investigation. The customary way of answering sectoral-level questions, especially in developing countries, is by building a CGE model. It was our original intent to also do this. However, after conducting an extensive review of CGE models [Kraev 2003], we have discovered that the CGE models have a major flaw: they are not really research tools as much as storytelling tools. That is, a CGE model can contain virtually any description of how a given economy fits together, and still be calibrated to data for any given country. Because CGEs only use data from one year, there is no way to verify how well a given CGE describes a given economy. Thus a CGE model is capable of little more than parroting back the assumptions that were built into it.

We address that problem by working with time series instead of a one-year slice such as a CGE would use. We compile a set of yearly Social Accounting Matrices (describing money flows) for years 1990-2001, and a set of monthly Financial Accounting matrices (describing financial stocks) for the same period, and use selected variables from that dataset to test specific hypotheses, such as whether the nontraded industry output is determined by demand or by productive capacity.

Investigation of yearly time series shows that government demand was the major driving force of the economy, all other institutions being net demand leaks most of the time; the share of imports vs. nontraded goods in demand for manufactures was extremely responsive to their relative price (elasticity over 1). Nontraded industry was seen to be demand-driven, while agriculture went through a change of regime around 1995, and was clearly supply-constrained after that.

It would be in principle possible to build a complete dynamic model based on the dataset we have compiled; however, it would be very work-intensive while yielding few extra insights compared to our approach. Investigation of well-chosen time series, combined with an in-depth discussion, is more transparent and represents at present a higher return to our time investment.

The quantitative analysis we have conducted was sufficient to conduct an overall assessment of structural adjustment policies in Ghana in the 1990s, and to make specific policy recommendations. The main reasons for the worsening macroeconomic performance were seen to be an overly liberal import tariff policy, a slowdown in foreign assistance, and a supply constraint in agriculture due to population growth and withdrawal of government support. These factors led to further problems, notably a severely deficient demand for domestic industry output, persistent balance of payments deficits and growing foreign debt. The overall distributional effects of structural adjustment were firstly, an overall increase in well-being compared to the crisis of early 1980s, and secondly, implicit (unintended) net incentives for labor relocation into the informal sector, which is problematic from both the perspective of productivity growth and poverty alleviation.

This is the basic strategy of the project so far. We think that we have reached a fairly good understanding of both macro and sectoral behavior of the Ghanaian economy; the next challenge is to extend that to the micro level by drawing on GLSS household survey datasets.

The rest of this paper consists four sections. Section 2 discusses the state of the Ghanaian economy in the 1990s based on existing literature; Section 3 outlines the empirical findings (briefly, as the present paper is aimed at the non-technical reader); Section 4 discusses the policy implications of our findings, and Section 5 presents some policy recommendations.

2 Overview of the Ghanaian Economy in the 1990s

This section briefly narrates the history of structural adjustment in Ghana, and reviews the literature on the structure of the Ghanaian economy and the reasons for the poor macroeconomic performance in the 1990s. Throughout this section, we point out unresolved questions and gaps in the literature, with a view to addressing these in Sections 3 and 4.

2.1 The economies of Sub-Saharan Africa

Let us begin with an overview of the economic and institutional specifics of the countries of Sub-Saharan Africa, in order to provide some context for the subsequent discussion of Ghana.

Probably the most well known characteristic of Sub-Saharan Africa as a region is the extent to which its growth performance during the last three decades has lagged below that of other regions. As a result of the combination of slow GDP growth rates with fast population growth, many African countries that were middle-income, comparable to the South Asian nations in the fifties and sixties have since become low-income countries with average per capita GDP growth below one percent and often negative.

Collier and Gunning [1999] provide a detailed discussion of different explanations advanced to explain that poor performance. On the domestic side, the governments were typically undemocratic and “captured by the educated, urban-resident population, with few agricultural or commercial interests. They expanded the public sector while imposing wide-ranging controls on private activity. [...] Since public sector employment was the main priority, [...] Africa experienced the paradox of poor public services despite relatively high public expenditure”. That, in turn, led to increasing transaction costs (for transactions such as transport, telecommunication and contract enforcement) and missing infrastructure, making private manufacturing unattractive. This situation continues to hold to this day, and is quoted as an important reason why private investment in Africa remains significantly below that of other countries with comparable income levels.

Also, “since the political base of the governments was urban, agriculture was heavily taxed and the public agronomic research [...] was neglected”. As on the one hand the population was predominantly rural, and on the other hand agricultural exports were for many countries the principal source of foreign exchange (necessary to buy intermediate inputs and capital goods for the domestic industries), that combination of policies typically led to decline in GDP and a balance of payments crisis. These are the major ways in which misguided domestic policies contributed to economic decline.

As a consequence, since the late 1970s the countries of Sub-Saharan Africa increasingly made use of loans from the International Monetary Fund and the World Bank as a solution to their balance of payments crises, and therefore were increasingly led to implement the set of policy measures advocated by these institutions, discussed above.

Sender [1999] critically discusses the consequences of these policy measures. His main criticism is that “Public investment as a share of GDP in Sub-Saharan Africa is now much lower than in any other region of the world. This has had negative effects on both the volume and the productivity of private investment in the region, because of the well-established complementarity between these two categories of investment. [...] Far too little attention has been given to the accumulation of evidence suggesting a causal relationship between the macroeconomic stabilization programs of the International Monetary Fund and declines in investment ratios”.

As far as the external connections of the economies in question are concerned, African countries’ exports were and remain concentrated in a few primary commodities, whose prices are notoriously volatile. (In a classification by Taylor [1988] of countries undergoing structural adjustment, the “externally strangled small primary product (or labor) exporters” category contained all African countries of the sample.) As Deaton [1999] points out, as a result of price-inelastic demand functions for primary commodities the variance of price can equal several times the variance of supply. For the exporting country, an upward spike in prices can then prove as difficult to manage as a downward spike, as the former easily leads to Dutch disease as well as tempting the government to enter commitments that cannot be upheld once the boom is over.

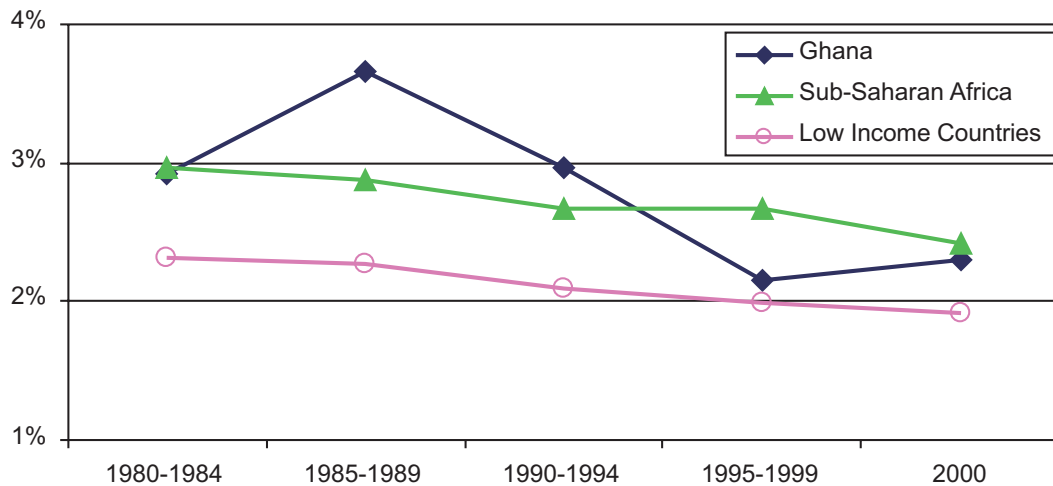


Figure 1: *Population Growth, Annual (World Development Indicators 2002)*

The neoclassical policy advice further encouraged expansion of primary commodity exports for all African countries on the basis of comparative advantage arguments. While neoliberal policies emphasizing export-led growth were often effective in the short term, in the medium term the simultaneous expansion in supply in fairly price-inelastic markets led to a continuous decrease in the terms of trade. Borenszstein et al. [1994] finds a secular downtrend in non-oil commodity prices since the mid-1970s. They further find that the supply expansion explains about 40 percent of the price change in the period 1971-1984, and over 60 percent in the period 1985-88. It is thus indeed primarily the supply expansion and not, say, efficiency increases or changes in demand by the industrial countries that is the primary cause of the adverse terms of trade trend.

Commodity price shocks also have immediate and far-reaching distributional effects, depending on the identity of the exporters (who can be small cocoa farmers or large mining companies) and the linkages of the export sector to the rest of the economy. Both of these factors are clearly country-specific.

2.2 The case of Ghana

The experience of Ghana during the last decades is largely representative of Sub-Saharan Africa as a whole. Population growth in Ghana was largely in line with the rest of the region, well above the low-income average (Figure 1).

Gross economic mismanagement during the 1970s led to an exchange rate that was almost 1000% overvalued and thus “not so much wrong as irrelevant to economic calculation” [Taylor 1988]. As a result, cocoa production, which was the main source of foreign exchange, had dropped drastically; domestic industries were unable to operate due to lack of parts and intermediate inputs.

After a turbulent period in 1978-1981 that saw several regimes come and go, Flt.-Lt. Jerry Rawlings came to power in a military coup on 31. December 1981. The first year of his rule consisted of what Gyimah-Boadi and Jeffries [2000] call “distributionist-cum-populist mobilization”, comprising large doses of vigilante justice aiming to root out corruption and restore economic justice. “The goods of hapless traders accused by vigilantes of hoarding and overpricing were confiscated and sold off to the public at reduced prices. In somewhat extreme but certainly dramatic cases, traders’ sheds and tables were destroyed and whole markets (tagged as ‘dens of corruption’ and symbols of the discredited commercial order) were razed to the ground.” [Gyimah-Boadi and Jeffries 2000, p.43]

However, after a year of such policies, which also coincided with a severe drought and a huge repatriation of Ghanaians from Nigeria in 1983, the government decided to change course and seek foreign assistance. It first approached the Soviet block, but was advised by them to turn to the IMF and the World Bank, which it did. The standard structural adjustment reform package (known in Ghana as the Economic Recovery Program) was proclaimed by the government, including a maxi-

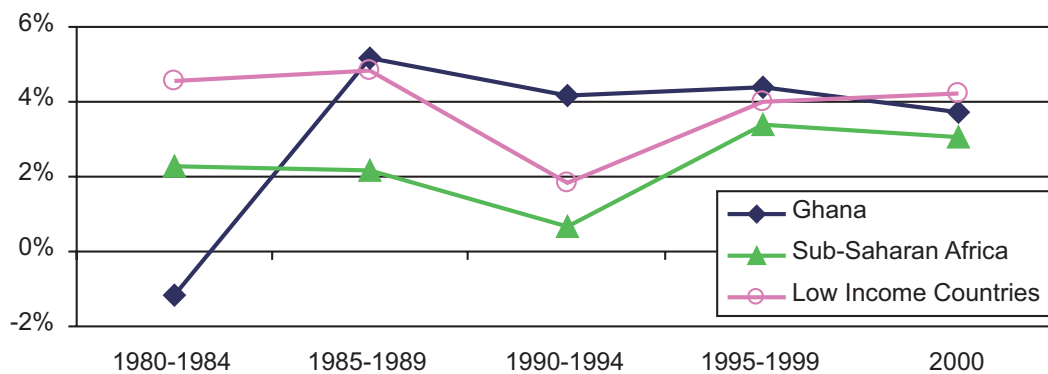


Figure 2: *GDP growth, Annual (World Development Indicators 2002)*

devaluation, fiscal austerity and tight money.

As Aryeetey and Tarp [2000] observe, reforms were designed on the basis of the neo-liberal orthodoxy, with a “particularly optimistic view about the efficacy of the market mechanism as a vehicle for promotion of efficiency and development, including misconceptions about the prevalence of institutional pre-conditions for market efficiency”.

According to Aryeetey and Tarp [2000], it was taken for granted that the government had better refrain from intervening in the economy, except from taking care of macroeconomic management and a few other minimalist functions. Not much attention was given to the second-best consideration that trade and market liberalization may not increase efficiency when some markets (such as insurance and credit markets) cannot be made to function properly. Crowding out of the public by the private sector was seen as the critical impediment, and little attention went to exploring what was required to make sure the private sector would indeed respond.

The policy reforms were accompanied by “abnormally high” capital receipts from abroad, mostly from multilateral and bilateral lenders [Killick and Malik 1995], that led to overall balance of payments surpluses in spite of persistent current account deficits as much-needed imports were brought into the country. The more realistic exchange rate, combined with good weather and decreases in smuggling due to better producer prices, increased cocoa export receipts; and thanks to the lifting of the foreign exchange constraint GDP grew by as much as 5% per year (Figure 2).

During the 1980s, these reforms were happening in the political context of a military dictatorship. While there were attempts by various groups to resist the reforms and to launch counter-coups, none of these were able to topple the regime or even present any very effective organized opposition to the reforms. Gyimah-Boadi and Jeffries [2000] attribute that to the unusual degree of skill and determination with which the reform process was managed, as well as to the fact that the regime enjoyed a substantial degree of popular support, while also resorting to strong repressive measures to silence any opposition. Overall, Ghana in the 1980s was a relatively strong (for the region), authoritarian state.

During the late 1980s the government has embarked on a series of democratization reforms such as decentralization and the establishment of district assemblies, and the early 1990s saw a return to multi-party politics, with a national election taking place in 1992 (with the party of Jerry Rawlings, the PNDC, coming out as the winner).

Given this combination of a relatively well-functioning (if authoritarian) state, wide economic reforms, rebounding GDP and export growth, and a broad move towards decentralization and democracy, it will come as no surprise that during the late 1980s Ghana was widely touted as the “Front-runner in adjustment” [Husain and Faruquee 1994]. As a result, the behavior of the Ghanaian economy was extensively studied by both proponents and opponents of structural adjustment, resulting in substantial literature on the subject.

The democratization process continued unabated through the 1990s. The elections of 1992 were followed by the next round in 1996 (PNDC winning again), and another in 2000, when PNDC lost

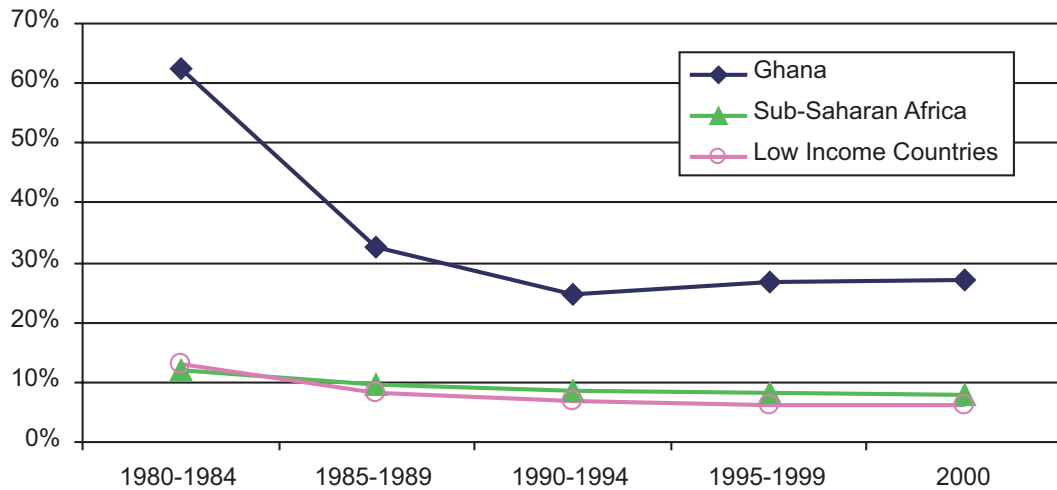


Figure 3: *GDP Deflator, Annual Inflation (World Development Indicators 2002)*

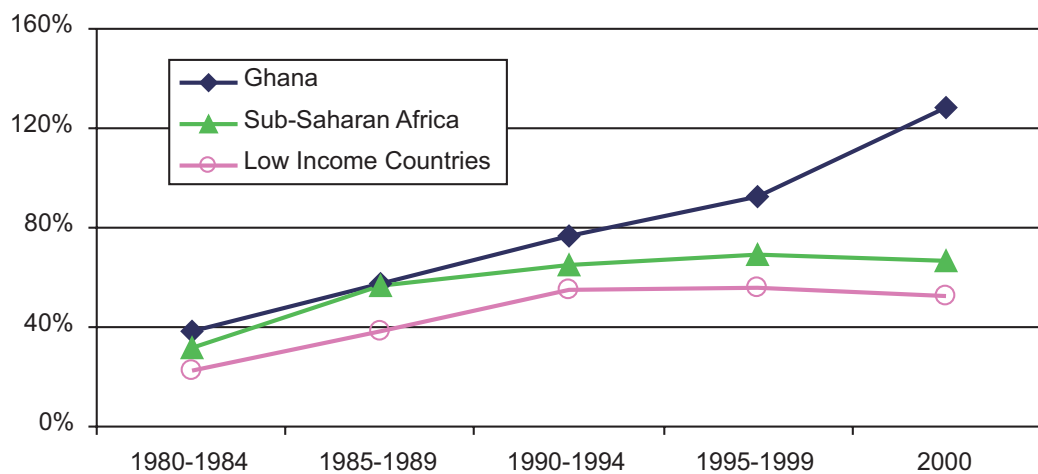


Figure 4: *Debt to GDP ratio (World Development Indicators 2002)*

and peacefully transferred power to the winning party. Overall, Ghana enjoyed remarkable political stability throughout the period, with occasional protests (for example, opposing the introduction of the Value Added Tax in 1995) but no civil unrest and no systematic opposition to the economic reforms.

Given the positive political developments, it is all the more disappointing that they were not matched by economic success. Inflation remained persistently high, averaging 30% per annum in 1986-89 (Figure 3). In order to boost its popularity prior to the 1992 elections, the government made excessive commitments that led to egregious budget deficits during 1992-1994, further fueling inflation during that period (fortunately, that was not as strongly the case for the subsequent elections). Capital formation remained depressed, with a total investment ratio estimated to be 6-12% in 1988 [Killick and Malik 1995], and even exhibited a slight downward trend in the 1990s [Kraev 2004b, Ch. 7]. The continuing capital inflows led to debt buildup and mounting interest payments. The medium-term benefits of liberalization didn't set in; growth turned from high in the late 80s to lagging in early to mid-90s (Figure 2), and external debt has increased to an extent that Ghana qualified for the Heavily Indebted Poor Countries (HIPC) initiative (Figure 4).

Let us discuss the key aspects of the Ghanaian economy in some more detail.

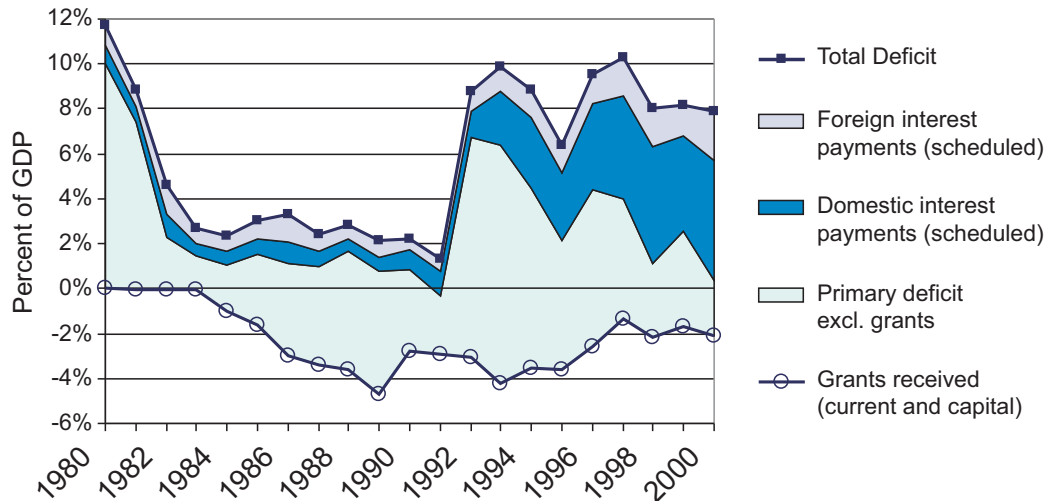


Figure 5: *Composition of the Fiscal Deficit (International Monetary Fund)*

2.3 Fiscal Policy

Let us begin with a brief discussion of fiscal policy. Fiscal austerity is one of the pillars of structural adjustment. The average deficit values for the last four five-year periods can be seen in Table 1; however, it might be more informative to look at a decomposition of the deficit over time in Figure 5.

As the figure packs quite a bit of information, let us go quickly over its contents. All values in Figure 5 are plotted as shares of GDP. The lowermost line (empty circles) represents the total grants received. As they *reduce* the deficit, they are plotted with a minus sign. The large area on top of that represents the primary deficit (that is, without taking into account the expenditure on interest payments) excluding grants; by stacking it onto the grants graph, its upper border represents the primary deficit including grants. Stacked on top of that there are the two areas representing interest payments on domestic and foreign debt, respectively. The topmost line (filled-in squares) is merely there to emphasize that all the areas together stack up to the total deficit.

Looking at Figure 5, we see several distinct periods. First, there is the period of turmoil in 1980-1982 with large deficits and no grants; then from 1984 until 1989 we see growing pre-grant primary deficits compensated by an even larger growth in grants, with the interest payments remaining comparatively small. In 1990 and 1991, grants fell, but so did the primary deficit, actually resulting in a tiny primary surplus.

Unfortunately, this fairly rosy picture unravels immediately after that. In 1992 (election year, bad cocoa harvest) revenues fell, expenditures rose, and foreign grants stayed low, leading to a huge primary deficit. The primary deficit remained high for the next couple of years, at the same time as grants were shrinking. While the primary deficit was brought under control from 1997 onwards, the interest payments on the debt accumulated during earlier excesses make sure the broad deficit never again fell under 6% of GDP, and generally stayed around 8%.

Summing up, fiscal policy during both the 1980s and the 1990s cannot really be characterized as particularly austere, with the worst excesses happening between 1992 and 1997, during the transition to democracy. As the next step in our investigation, let us see whether monetary policy was as tight as fiscal policy was austere.

2.4 Monetary Policy

To get a picture of monetary policy, let us look at three variables: growth rate in broad money supply, nominal interest rates (treasury bills) and real interest rates, as pictured in Figure 6. To compute real interest rates, we subtracted year-on-year CPI inflation from the nominal interest rates. CPI was

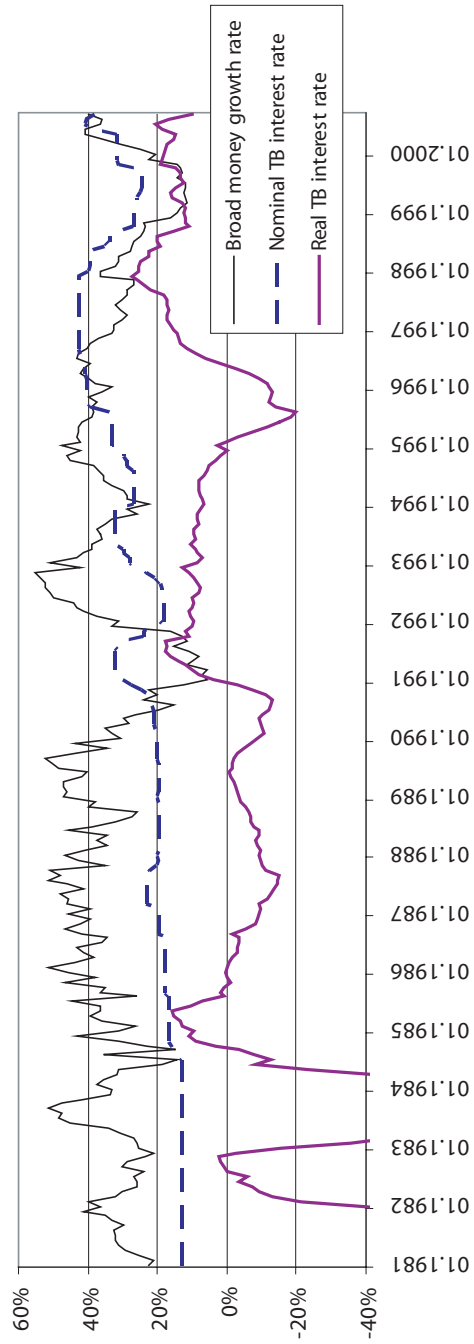


Figure 6: Monetary Policy Indicators

	1980-1984	1985-1989	1990-1994	1995-1999	2000
Primary deficit as % of GDP	4.5%	1.2%	3.6%	2.8%	0.4%
Total deficit as % of GDP	6.0%	2.7%	5.9%	8.5%	9.7%
External Debt as % of GDP	38%	58%	77%	92%	128%
Domestic Debt as % of GDP	0%	0%	8%	23%	29%
Broad money growth rate	32%	42%	33%	28%	35%
Nominal TB interest rate	13%	20%	27%	36%	35%
Real TB interest rate ¹	-40%	-6%	9%	14%	17%
Effective import tariff	25%	16%	15%	14%	13%
Effective cocoa duty	51%	35%	28%	35%	14%
Current Account as % of GDP	-3.4%	-1.9%	-5.5%	-6.6%	-7.9%
Exchange rate overvaluation	1279%	50%	4%	1%	0%

Table 1: *Indicators of Ghana's adherence to Structural Adjustment policies.*

chosen because it is the most readily available deflator, and year-on-year inflation was computed to avoid interference from the (quite strong) seasonal effects in inflation. Likewise, money supply growth is year-on-year. The averages of the same three variables over five-year periods are also reproduced in Table 1.

What Figure 6 tells us is that monetary policy since 1980 has been anything but tight. During the the 1980s, real interest rates were more often than not negative, and money supply growth rates of over 40% were quite common. Money supply has grown in the 1980s mainly because of the high foreign exchange inflows that were monetized by the Bank of Ghana, and in the 1990s primarily because of government deficits. In the 1990s, likely in reaction to the fiscal excesses, interest rates were raised somewhat, but were still occasionally negative for extended periods; and money supply growth likewise slowed down, but not by much.

High interest rate spreads between lending and deposit rates meant that real rates on deposits were even more likely to be negative than treasury bill rates, giving no incentive to save with the banks. Instead of savings accounts, holding foreign exchange was widely used as way of storing wealth, so that from 1997 BoG included forex holdings in the definition of money. [Brownbridge et al. 2000]

Stimulating credit to the private sector was one of the goals of the Economic Recovery Program. However, that was hard to achieve because of extremely high government borrowing. On the one hand, the government borrowed from the Bank of Ghana, thus increasing the money supply; on the other hand, it also borrowed from the domestic commercial banks, making commercial credit scarce. As raising interest rates on treasury bills did not increase savings much, tight restrictions on bank lending to the private sector were necessary to avoid even more money supply growth.

The Bank of Ghana had very little room for manoeuvre: If it accommodated government borrowing demand, it could only control money supply growth by constraining private sector borrowing; however the latter is only 30% of the broad money supply [Aryeetey and Harrigan 2000].

The result was a crowding out of the private sector from the credit market (although reserve requirements of commercial banks e.g. in 1993 were 52% of Bank of Ghana bills plus 5% cash, actual rates were over 70% [Aryeetey and Harrigan 2000]) and strangulation of investment. Bank credit to the private sector averaged less than 5% of GDP, and if we adjust it for the increased cost of capital goods (mostly imported), it hardly grew at all in real terms [Brownbridge et al. 2000].

What little bank lending went to the private sector financed working capital rather than investment, especially as the need for working capital went up with constant inflation and depreciation [Aryeetey and Harrigan 2000]. Discussions with private investors and executives of the Private Enterprises Foundation suggested that high nominal interest rates made firms reluctant to use loans for investment purposes, and also increased cost of operation, thus pushing up prices [Brownbridge et al. 2000]. Even though real interest rates were not that high, even in the 1990s, high nominal interest rates combined

with very volatile inflation made real rates hard to predict, making borrowing to invest too risky.

From this discussion we extract two hypotheses: firstly, that interest rates had little impact on the money supply and secondly, that interest rates were a cost-push factor, and thus increasing interest rates increased inflation.

As we will see in Section 3.2, our econometrics on data from the 1990s suggest that interest rates did not have a direct impact on inflation, and that their impact on money supply was statistically significant but so small as to make them almost useless as a practical instrument for controlling money supply growth.

2.5 Inflation

One of the persistent problems of the Ghanaian economy has been out-of-control inflation - as Figure 3 shows, it was almost triple the average value for either Sub-Saharan Africa or the low-income countries. Given the huge growth in money supply throughout the 1980s and 1990s, it is not surprising that this growth is usually taken as the main explanation for the high inflation rates. However, there are also dissenting opinions.

The view that money supply was the primary driver of inflation is critiqued by Sowa et al. [Sowa and Kwakye 1991, Sowa 1994, CEPA 1996], who argue that real-side factors matter more in the inflationary spiral. Their econometric regressions are used to suggest that elasticity of inflation with respect to output is almost unity, so output volatility (especially in food production, which has a weight of 50% of CPI) rather than monetary factors drive inflation.

Another supply-side explanation for the persistent inflation is the low growth rate and capacity utilization of the industrial sector. However, as Aryeetey and Harrigan [2000] remark, that seems unlikely to be a major influence as the industrial sector is so small (less than 10% of GDP).

Upon reviewing the above supply-side arguments, Aryeetey and Harrigan [2000] conclude that they might explain the short-term jumps in inflation (for instance during a drought, such as the 60% inflation rate in 1995) but not persistent high inflation, unless there are continued high rates of monetary growth. A structuralist explanation would only be useful if it could show that the huge money supply growth rates since the start of ERP were caused by inflation rather than vice versa.

This debate is clearly central to one of our research questions, namely understanding of inflation, and we are able provide substantial evidence allowing us to evaluate the above debates. In Section 3.2, we will see that our econometrics on data from the 1990s suggest that broad money supply growth was by far the dominant determinant of inflation, followed by wholesale food crop prices and fuel prices. In fact, as Figures 13 and 14 in Section 3.2 illustrate, these three factors are sufficient for quite accurate inflation predictions within the period.

2.6 Sectoral Behavior

A major goal of most structural adjustment programs is eliminating or reducing what is perceived as price distortions, in particular government subsidies and tariffs. That was also the case in Ghana. This section discusses the sectoral implications.

The sectoral structure of the Ghanaian economy is dominated by agriculture (primarily food for domestic consumption and cocoa for export) followed by a large services sector (some 40% of GDP). The industrial sector is dominated by mining, which is largely foreign owned and has few linkages to the rest of the economy.

The agricultural sector in Ghana is crucial for any poverty reduction strategy, containing as it does over half of the country's working population and having by far the highest poverty incidence. Thus, impacts on the agricultural sector are an important gauge of distributional impacts of a policy.

The impacts of the ERP on the agricultural sector appear to have been mixed. On the one hand, the initial opening up to foreign trade and the flood of foreign assistance to finance it led to increased availability of capital goods and inputs such as fertilizer; furthermore, the cocoa producers profited from increased producer prices of cocoa and from liberalization of cocoa marketing. On the other hand, the food subsector appears to be weakened by the switch to price incentives for cash crops and by increased cost of fertilizer and labor.

According to Nyanteng and Seini [2000], the level of productivity is generally low due to poor farming practices and very low use of fertilizer, the latter additionally depressed by fertilizer subsidy cuts. Likewise, removal of subsidies on insecticides and fungicides almost tripled their real prices. As government pulled out of procurement, supply and distribution of inputs, private sector did not jump in to fill the gap, resulting in decreased availability.

A major constraint on the marketing of foodstuffs is the poor infrastructure; transportation alone is said to contribute as much as 70% to marketing costs, and storage losses are estimated at between 15% and 30%.

Let us now consider the policies of the ERP that affected the industrial sector. A major component of the program was a package of investment incentives, including unlimited repatriation of profits, a reduction in corporate tax rates, and a shift in price incentives for investment favoring export industries and disadvantageous to formerly protected manufacturing industries.

The main components of the industrial sector are mining, manufacturing (largely for the domestic market), and utilities (largely government-owned). As we have mentioned, mining is mostly foreign-owned and its products are mostly exported. Investment in mining is largely foreign-financed, and thus apart from providing some employment, tax revenue, and modest intermediate input demand, the mining sector appears to be largely insulated from the rest of the economy.

In response to the investment incentives listed above together with generous tax concessions, the mining sector did indeed grow substantially. However, the impacts of ERP policies on domestic manufacturing appear to have been largely negative.

Real depreciation and real interest rate raises led to almost a doubling of the cost of capital goods relative to the GDP deflator from 1983 to 1991 [Brownbridge et al. 2000, Table 4.2]. That did not affect mining as it was largely indifferent to domestic price levels, but it combined with the competition from increased imports to depress manufacturing. Average capacity utilization for medium and large factories was between 40% and 46% during 1990-1993 [IMF 1998, Table 12] Apparently, capacity utilization data was no longer collected after 1993.

From this discussion we extract the following testable hypotheses. Firstly, from the reduction of government support programs for agriculture we would expect an increased scarcity of domestic food production, expressed in the increase of its relative price. Secondly, this increase may or may not have been a major driver of overall inflation, as the producer price of crops at the farm gate appears to be a small percentage of retail price of food, due among other things to high transport costs. Thirdly, it would be interesting to know how strongly the composition of output in agriculture and industry (export vs. nontraded) responds to relative price – relative price adjustments being the mainstay of mainstream theory and policy design. Finally, we would like to ask whether industry and manufacturing are primarily demand-driven or supply-constrained. This is important in terms of policy design, as a supply-constrained sector would primarily need capital investment (private or public) to expand its output, regardless of the fiscal policy stance, while a demand-driven sector would be harmed by austerity and benefited by a loose fiscal policy. Note that the answers to the above questions can be different for agriculture and industry.

Sections 3.2 and 3.3 contain the evidence we find regarding the above questions.

2.7 Overall Distributive Impacts and the Labor Market

In this section, we address the distributional impacts of the structural adjustment policies. As a deep investigation of household survey data was unfortunately beyond the scope of this project, we have to restrict ourselves to drawing conclusions from the sectoral discussion above to distributive impacts on the households grouped by their main source of income.

First of all, the state of the economy in the 1990s, while not stellar, was in many respects vastly superior to the state of the economy in the early 1980s, in the few years prior to the adoption of the structural adjustment program. All population groups have profited from the positive GDP growth and increased availability of imports, both production inputs and final goods. However, on top of that various sectors were affected differently. Employment in manufacturing was adversely affected by low demand, removal of protection, and high interest rates; the displaced workers ended up in the

informal sector, mainly providing services. Likewise, agriculture, in particular food crop production, was adversely affected by removal of government support programs and competition from imports. Cocoa producers, while also adversely affected by removal of government support programs, fared comparatively better due to increased cocoa purchasing prices. The sector least adversely affected by liberalization was the informal sector, as it was never government-supported in the first place and produced almost exclusively nontradable goods, so faced no competition from imports.

Summing up, while positive GDP growth profited all population groups to some extent, the food farmers and formal sector employees fared worst of all, while informal sector was least adversely affected (largely by default). Thus the net incentives worked towards reallocation of the labor force into the informal sector. Let us see if labor market data confirm that analysis.

The availability of data on labor market is much lower than that on macroeconomic indicators. No yearly data for overall employment composition are being collected in Ghana to the best of the author's knowledge. The only source of employment composition data are various surveys happening at irregular intervals. The most detailed of these is the Ghana Living Standards Survey (GLSS), of which a total of four rounds have been conducted, in 1987, 1988, 1991 and 1998.

Figure 7 shows the composition of the labor force in absolute and percentage terms.

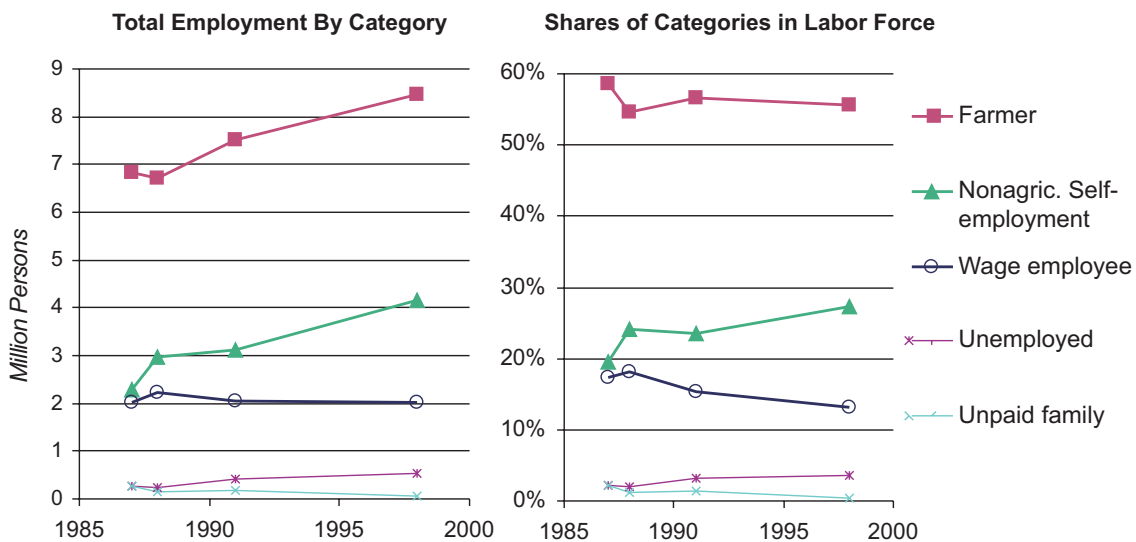


Figure 7: *Employment composition (GLSS1-4 and author's estimates)*

We see that the majority of the population are farmers, followed by non-agricultural self employment (transport, personal services, etc. - most of these activities fall into the informal sector) and wage employees.

To get an idea of the relative attractiveness of the different occupations, consider Figure 8, showing the composition of an average household's income across different occupations in 1998, derived by the author from GLSS4 data. For a sense of proportion, note that the poverty line at that time was 0.7 million cedis *per person*. Seeing that the income of an average food farmer *household* is barely twice that, and that of an average informal sector or cocoa farmer household about three times that, it will come as no surprise that the vast majority of the rural population is poor, and that employment in the informal sector presents only a marginally better alternative.

From Figure 7 we see that the share of population in agriculture is sinking, but very slowly. Unfortunately, that decrease goes not go towards the lucrative wage employment in the modern sector, but towards the informal sector which serves as a catch-all. The share of wage employees in the labor force has been stagnating in absolute terms, and thus decreasing in relative terms.

Disaggregating wage employment between government, state enterprises, and private firms (data not shown here) we see that the labor force employed by government has been fairly stable, the labor force employed by the state enterprises has sunk drastically (due to extensive divestiture programs) and increases in employment by private firms have just about made up for that decrease, with no

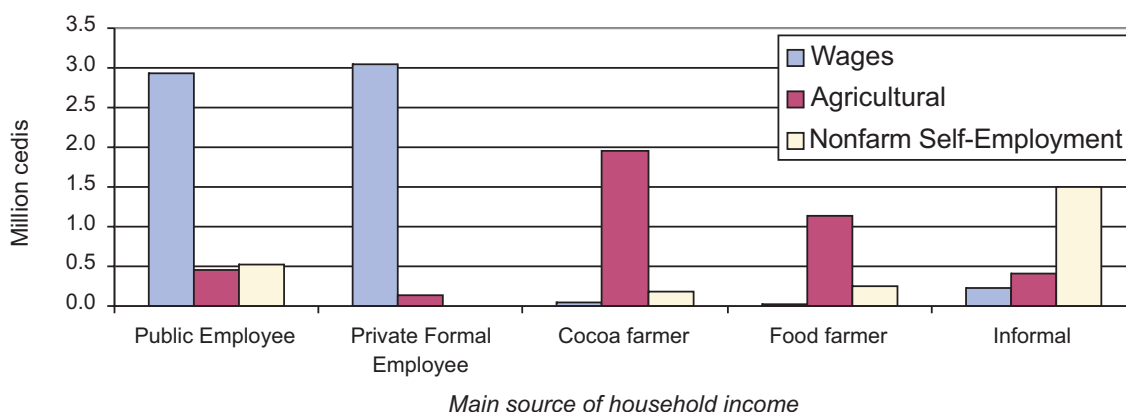


Figure 8: Average Households' Income Composition in 1993 by Main Occupation (author's estimates from GLSS4 data)

overall growth in absolute terms.

According to Aryeetey and Tarp [2000], the least addressed aspect of fiscal adjustment is its effect on employment, both directly on public employment and through demand effects. Reductions in import duties also had negative impact on domestic employment, and displaced workers mostly landed in the informal sector, further depressing its productivity.

This is a disturbing trend, as the informal sector is one of the least productive sectors of the economy, and offers few perspectives for development. To have a chance at working its way out of poverty, Ghana must find ways to stimulate its agricultural sector, which still contains the majority of the population and the vast majority of the poor, and its industrial sector, which is the most promising in terms of higher productivity, lowering of import dependence, and supply of high value added exports.

2.8 External Trade and Balance of Payments

Another major component of the ERP was to liberalize the trade and payments regime. According to Aryeetey and Harrigan [2000], that had the following goals: narrow the gap between official and parallel exchange rate, provide foreign exchange to ease import strangulation, achieve a viable balance of payments position, clear up arrears, and introduce current account convertibility.

The means to that were devaluations in 1983-86, a foreign exchange auction from 1986, and a free interbank market from 1992 onwards. This was accompanied by a gradual liberalization of imports, with import licenses abolished in 1989 and import tariff rate lowered to between 10% and 30%. Export policies were also gradually liberalized, allowing exporters to retain an increasing share of earnings, reaching 100% in 1991 for all exports except gold and cocoa. The import liberalization programme and the forex auction could only be maintained with the help of foreign transfers [Aryeetey and Harrigan 2000].

Figure 9 shows the effective tariff rates on imports and on cocoa exports. The effective tariff rates are computed as the ratio of duties actually collected over the total value of imports resp. exports. The five-year averages of these rates are reported in Table 1, which also contains the degree of exchange rate overvaluation (computed from official and parallel exchange rate data in Reinhart and Rogoff [2004]). The tariffs on non-cocoa exports were so low as to be negligible (low single digits). While the tariffs on cocoa are not exactly low, their importance among overall exports is decreasing as the revenue from cocoa exports has been overtaken by both gold and non-traditional exports over the course of the 1990s. What Figure 9 and Table 1 tell us is that as opposed to tight money and austere fiscal policy (which did not happen), trade liberalization was quite real and sustained. Import tariffs went down and stayed that way, minor fluctuations notwithstanding; exchange rate overvaluation was eradicated by the beginning of the 1990s; and as can be seen in Figure 10, both imports and exports

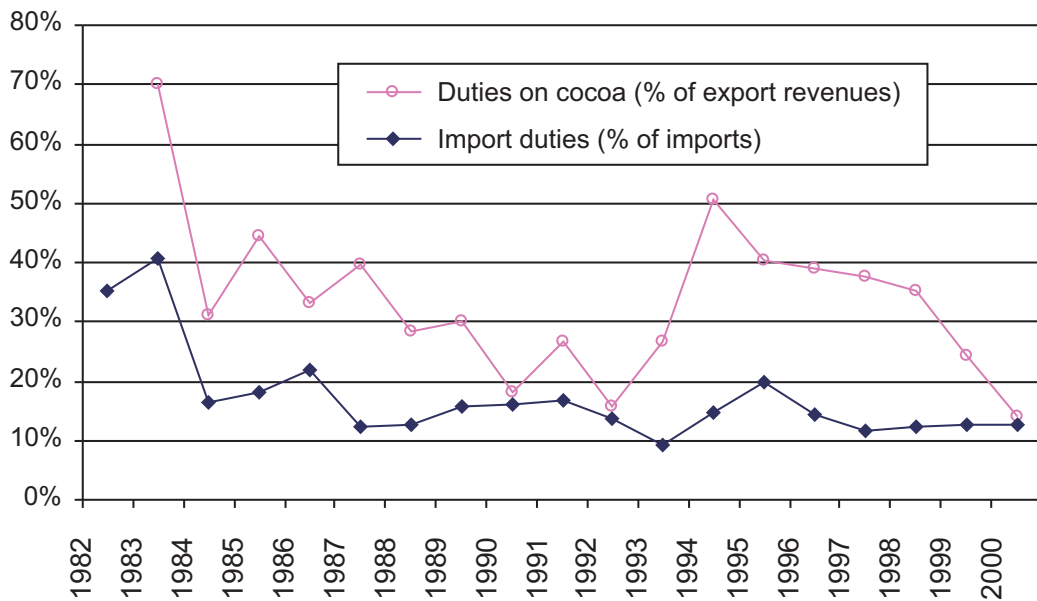


Figure 9: *Effective Tariff Rates on Trade (World Development Indicators 2002, Oduro [2000], International Monetary Fund)*

were growing as shares of GDP.

Thus, the goals of trade liberalization have been mostly achieved, with the exception of a viable balance of payments position. Looking at the data, we see a continuous nominal depreciation of the exchange rate, approximately (but not exactly) keeping pace with inflation, and a steady increase in volumes of exports and imports, in absolute terms as well as as a share of GDP (Figure 10). Although imports and exports grew at about the same rate, the trade balance was always in deficit as the total volume of imports exceeded that of exports by a large margin.

In the early ERP, the overriding objective of trade policy was stimulation of exports. Since 1990s, competing policy objectives have emerged: “Expansionary fiscal and monetary policies have placed pressure on the balance of payments making import liberalization balance of payments incompatible as well as placing pressure on the government budget making import liberalization through reduced tariffs fiscally incompatible” [Oduro 2000].

As a result of the investment surge in mining, gold exports are now ahead of cocoa, but since the former are dominated by transnational firms, the net foreign exchange inflows they generate are

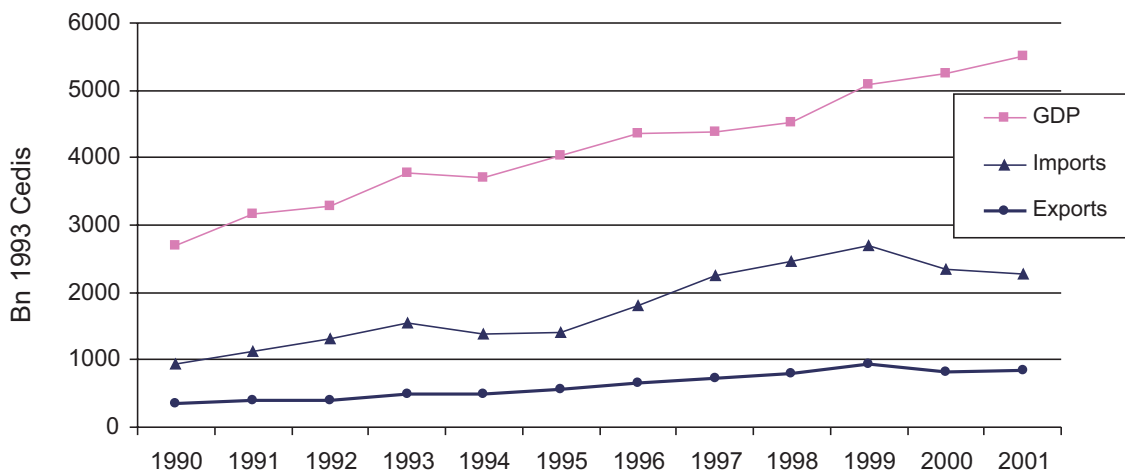


Figure 10: *GDP, imports, and exports in real terms (author’s estimates [Kraev 2004b])*

comparatively small because of profit repatriation and salaries of expatriate staff [Oduro 2000].

The export-led growth dominated by few primary commodities (cocoa, gold and timber) also made Ghana increasingly vulnerable to fluctuations in international commodity prices. Ghana experienced a double terms of trade shock starting 1999 (Figure 11), with cocoa prices low and oil prices high.

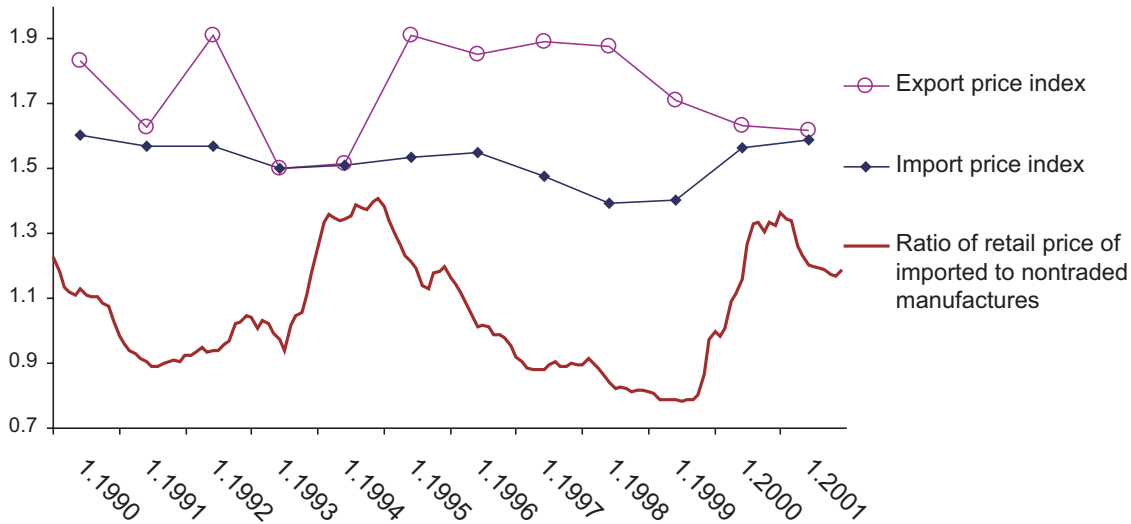


Figure 11: *Some Price Indices (IMF Ghana Desk Country Reports and author's estimates)*

The results were a substantial devaluation, as well as a further increase in external debt and inflation.

The continuing current account deficits were financed by capital inflows, especially official transfers - leading to a steady increase in external debt from 36.6% of GNP (1982) to 128.3% (2000) (Figure 4). While donor assistance was plentiful in the 1980s, the macroeconomic instability in the 1990s (exchange rate instability, rapid money supply growth, inflation, and high government budget deficits) had a negative effect on aid flows [Harrigan and Younger 2000], as a glance on Figure 5 will confirm.

Based on this discussion, we would like to ask the following questions: firstly, what are the main drivers of import demand? To be precise, how responsive is import demand to the relative price of imports vs. domestically produced goods, and is there an additional increasing time trend in import demand due to the structural opening up of the economy? The corresponding question with regard to export supply has already been posed in the previous section. We will see in Section 3.3 that while the share of imports in demand is quite responsive to the relative price (elasticity of about -1), the ratio of cocoa exports to nontraded agricultural output is much less so (elasticity of about .3). There is furthermore an exogenous upwards trend in both imports and exports of about the same magnitude, which is slowing down towards the end of the decade.

Secondly, it would be very interesting to understand the behavior of the exchange rate and the degree to which it interacts with the domestic price level. As Figure 11 shows, the exchange rate's behavior was quite volatile, so that prices of imports relative to nontraded goods varied over as much as a factor of two; thus the role of floating exchange rate as the stabilizer for the real exchange rate deserves to be questioned.

The research questions posed throughout this section were not rhetorical. The core of our project was addressing these through empirical investigation of available data, much of which had first to be compiled from a variety of sources. The following section is a brief summary of our methodology and results, and Section 4 provides an in-depth discussion of their policy implications.

3 Our Methods and Empirical Findings

This section briefly summarizes the findings from an in-depth quantitative analysis of Ghanaian data for the period 1990-2001. That analysis began by compiling a yearly time series of Social Accounting

Matrices, and a monthly time series of Financial Accounting Matrices (FAMs, containing financial asset stocks such as demand deposits and monetary base) that was consistent with the SAM time series. The FAM methodology is described in detail in Kraev [2004a], and the actual dataset compilation in Kraev [2004b].

We then used the SAM/FAM time series to test a series of hypotheses about both real-side variables such as price elasticity of import demand, and financial variables such as inflation and money supply growth. As all financial time series were available monthly for most of the period 1990-2001, we could investigate them using ARIMA-X (AutoRegressive Integrated Moving Average with eXogenous variables) econometrics. On the other hand, real-side data was only available yearly, so we tested various hypotheses about it by splitting our time period into estimation (1990-1997) and validation (1998-2001) periods, and used the estimation period data to fit a number of functional forms. The functional form that then gave the best prediction performance for the validation period was chosen as the best hypothesis. Details of the procedure and the results are documented in Kraev [2004b], and a summary of the results follows.

3.1 Compiling a Dataset: SAM/FAM time series for 1990-2001

We begin by compiling a yearly time series of Social Accounting Matrices (SAMs), each of which is a complete picture of the money flows in the Ghanaian economy in a given year, at a certain level of aggregation. Then, we augment this by a monthly time series of Financial Accounting Matrices (FAMs) that describe the financial stocks held by the various institutions in the Ghanaian economy. The two datasets are logically connected as the net lending flows of an institution in each SAM have to be consistent with the changes in that institution's net worth (after correcting for revaluation). We achieve that consistency by forcing the SAMs to yield the net lending flows implied by the FAMs, for the following reason.

In developing countries, financial asset stock time series are available and generally more reliable than most flow data. Besides being interesting in its own right, knowledge of financial asset stock time series allows us to get more reliable estimates for net financial savings (net lending) of each institution. In an economy where some important sectors are demand-driven (that is, probably, any economy), knowledge of net lending is important to account for injections and leakages contributing to the aggregate demand. Unfortunately, net lending is normally computed as a residual from flow data, and is thus quite unreliable; using asset stocks for that purpose makes for a much more reliable estimate.

Compiling a SAM/FAM time series dataset such as ours is worthwhile for several reasons: firstly, in the process of compilation one discovers the errors and inconsistencies in the data and can to an extent correct for these, or at least draw conclusions as to which uses of that data are meaningful even in view of the errors and which are not (Kraev [2004b, Ch. 7] discusses several grave errors in official data that we could discover and to an extent correct).

Thirdly, a sufficiently long stock-flow consistent SAM-FAM time series provides a sufficient data base for estimation *and* validation of a multisectoral dynamic model. A complete set of real and nominal flow time series allows us to derive the causal behavior of the model from history, instead of specifying it a priori as the CGE models do, be they neoclassical or structuralist. Further, if we split the SAM-FAM time series into an estimation and a validation segment, we can also gain an idea of how good the chosen causal structure is at predicting future behavior of the economy. Such an approach unites the advantage of a CGE-like ability to handle sectoral disaggregation and a high number of variables with an ability to specify measures of confidence of the model output.

Finally, as the present project demonstrates, such a dataset can be used to understand the overall structure of an economy through statistical testing of specific relationships, even without estimating a complete model. This is an advantage for our approach's potential to be replicated in other developing countries, where technical capacity constraints are often binding.

Summing up, we demonstrate that in spite of low data quality and availability, it is feasible to construct stock-flow consistent SAM/FAM time series for Ghana for more than a decade, providing a strong foundation for further analysis. While that is not a novel approach for industrialized countries

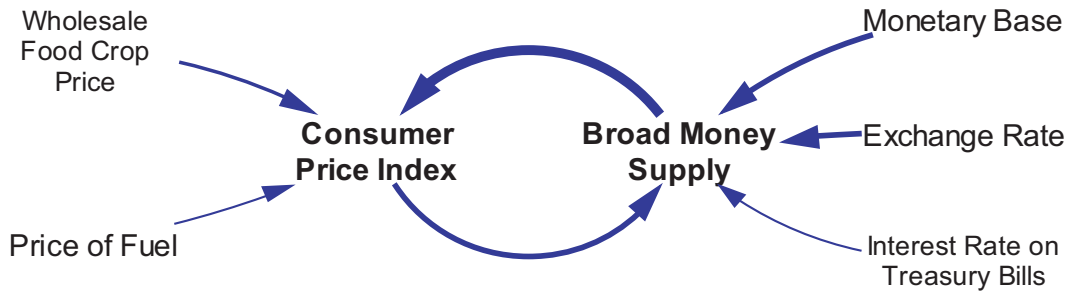


Figure 12: A Summary of the Inflation Model We Identify. Thickness of arrows indicates strength of influence.

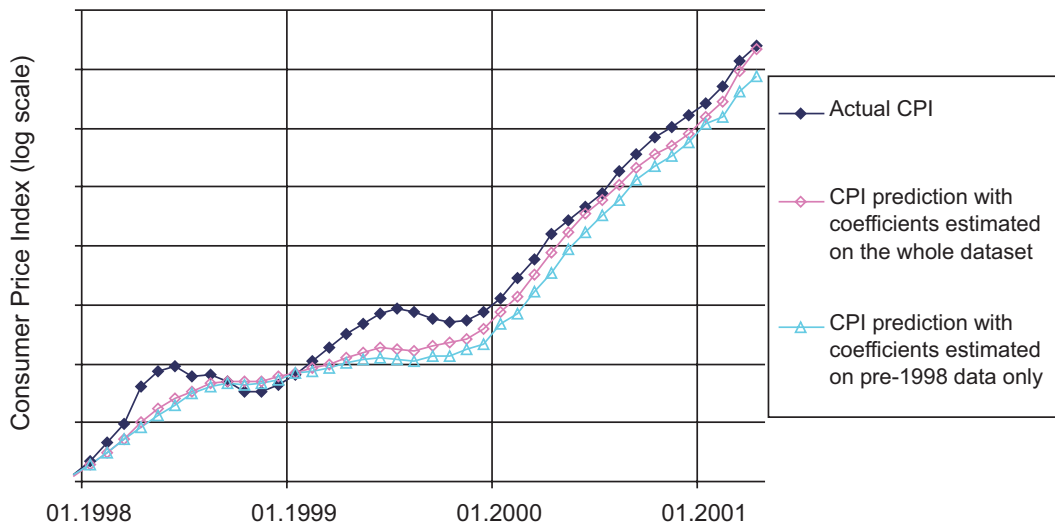


Figure 13: Actual CPI vs. predictions from ARIMA-X regressions

with their high data availability, to the best of our knowledge this is the first time such a dataset has been compiled for a developing country.

The SAM and FAM time series dataset is available upon request as an Excel file.

3.2 Consumer Price Index, Money Supply and the Exchange Rate

We used ARIMA-X regressions to explain the behavior of the three variables Consumer Price Index, broad money supply, and the exchange rate, which we denote (in log form) *cpi*, *m2* and *er*. All of these were found to be $I(1)$, and in none of the regressions could cointegration be observed. Therefore, the regressions were run on the first differences (corresponding to growth rates of the underlying variables).

The overall story of inflation and money supply growth is summarized in Figure 12. We started out by investigating the behavior of the Consumer Price Index, arriving at both expected and unexpected results. On the expected side, money supply is highly significant for price formation, and takes its effect gradually over with a lag of two to nine months. Increases in fuel and wholesale food crop prices are also highly significant, but their impacts happen over a much shorter period (0-2 months). Using just these three variables, we could predict *cpi* surprisingly well four years into the future (1998-2001), with coefficients estimated using pre-1998 data only (Figure 13). The decomposition of inflation into contributions of broad money supply growth, fuel price inflation, and wholesale food crop price inflation is shown in Figure 14.

On the surprising side, exchange rate depreciation, interest rate changes, and GDP growth appear to not have a significant direct effect on inflation. The noise term was found to be $ar(1)$.

As growth of broad money supply was found to be the major driver of CPI inflation, we proceeded to

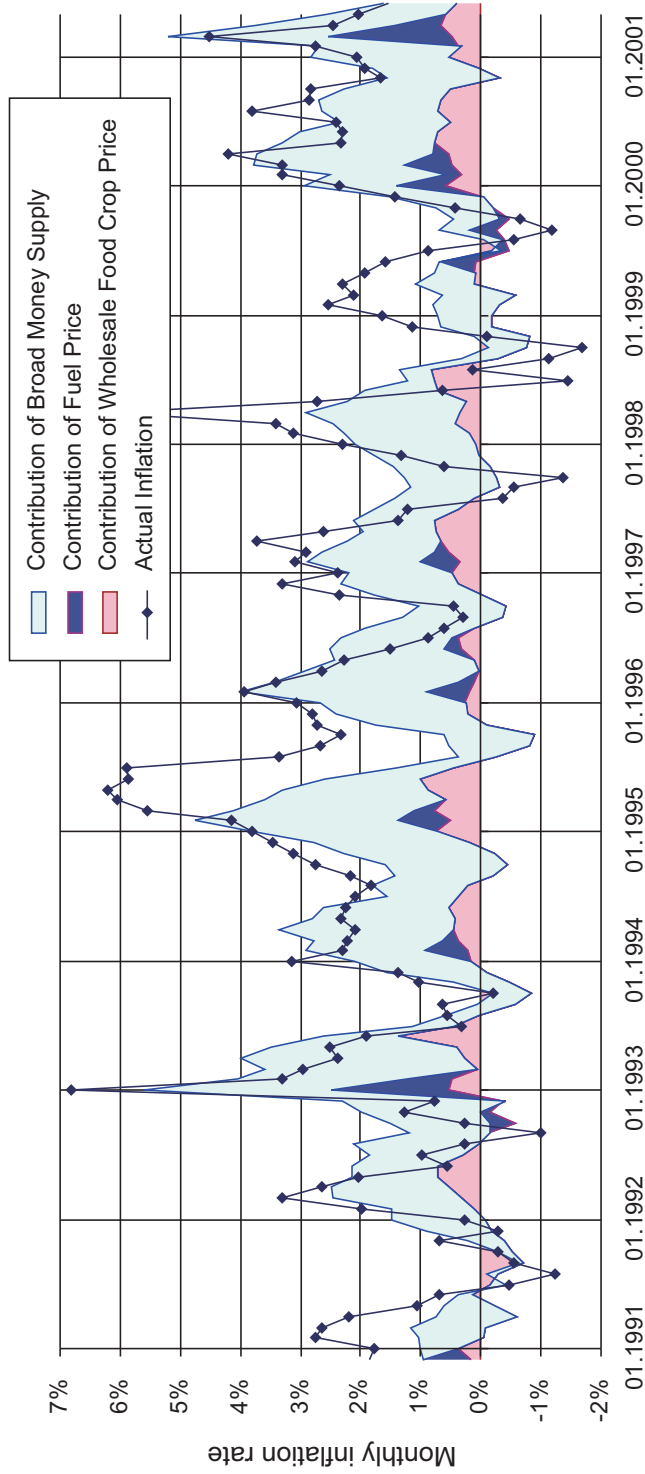


Figure 14: Decomposition of Inflation by Source [Kraev 2004b]

investigate the dependence of broad money supply growth on the changes in interest rates, inflation, exchange rate depreciation, and base money growth, as well as its own past values. The results showed no autoregressive or moving-average components, but a strong dependence on the exchange rate, monetary base, and Consumer Price Index, as well as a statistically significant but rather small response to interest rates (an interest rate increase of 10 percentage points causing a one-time 8% reduction in money supply); all coefficients had signs and magnitudes that are reasonable from a theoretical standpoint.

From a .37 coefficient of the depreciation rate in the `m2` regression, combined with the fact that exchange rate depreciation was not significant in the `cpi` regression, we could draw the somewhat surprising conclusion that the main channel for the impact of currency depreciation on inflation is not through cost-push such as cost of imports, but through revaluation of the money supply.

In contrast to the CPI regression, all effects are quite fast, taking at most 3 months for the full impact to be felt; the predictions of post-January 1998 values based on the regressions exhibited realistic behavior and were quite robust with respect to the estimation time period, but were not as precise as the CPI predictors, tending to over-estimate broad money supply.

The two regressions we just discussed implied that if we considered broad money supply `m2` to be given in advance (as a function of time), a change of one percent in `m2` would over time lead to a change of about .33 percent in `cpi`; conversely, if we considered the price level to be exogenous, a one percent increase in it would lead over time to about a .67 percent increase in `m2`.

In reality, neither of them is given, but rather both evolve (approximately) according to their behavioral equations that we have estimated in the previous section. Therefore, the two variables form a feedback loop - a change in the money supply, happening for whatever reason, will lead to an increase in the price level, which will in turn lead to an increase in money supply, etc., amplifying the initial impact. In fact, the total impact can be computed as a geometric progression and found to be $1/(1 - 0.33 * 0.67) \approx 1.3$, so that the feedback loop amplifies by about 30% any effects of other variables on CPI inflation or broad money supply growth - not a huge effect, but not negligible either.

Following the same model identification strategy that led us to success in explaining the behavior of `cpi` and `m2`, we identify a model of exchange rate behavior. The only two significant variables turn out to be the import price index, each 1% increase in it translating into a 4% depreciation over a year's time; and the interest rate, with interest rate increase by 1% *increasing* depreciation by one third of a percent.

Unlike in the cases of `cpi` and `m2`, however, the estimated model proves to be quite bad at predicting values of `er` when used as a recursive equation. When we estimate the same model using only pre-January 1998 data, essentially only the constant term survives. The prediction behavior is even worse when we repeat the model estimation over regressions without a constant.

These problems, together with a brief qualitative discussion of exchange rate behavior, led us to conjecture that better understanding of the exchange rate behavior would require separate study of managed floating and freely falling periods, as well as of the conditions for the change between the two modes.

3.3 Real-Side Variables

While we are lucky enough to have monthly time series for the key nominal indicators (such as the Consumer Price Index, the exchange rate, and the money supply), the real-side sectoral data, along with most nominal flow data, is only available on a yearly basis.

As our sample length of 12 years is too short to allow for rigorous econometrics, we use a different method to evaluate hypotheses of real-side behavior. We take the years 1990-1997 as the estimation period and the years 1998-2001 as the validation period. We use the estimation period data to estimate the coefficients of behavioral hypotheses and then use their ability to predict the validation period data as the way to choose between the different hypotheses.

This approach has the potential to increase our confidence in the choice of functional form, as a good fit in the estimation period does not necessarily translate into a good prediction ability in the validation period. On the other hand, if a functional formulation was good at predicting the

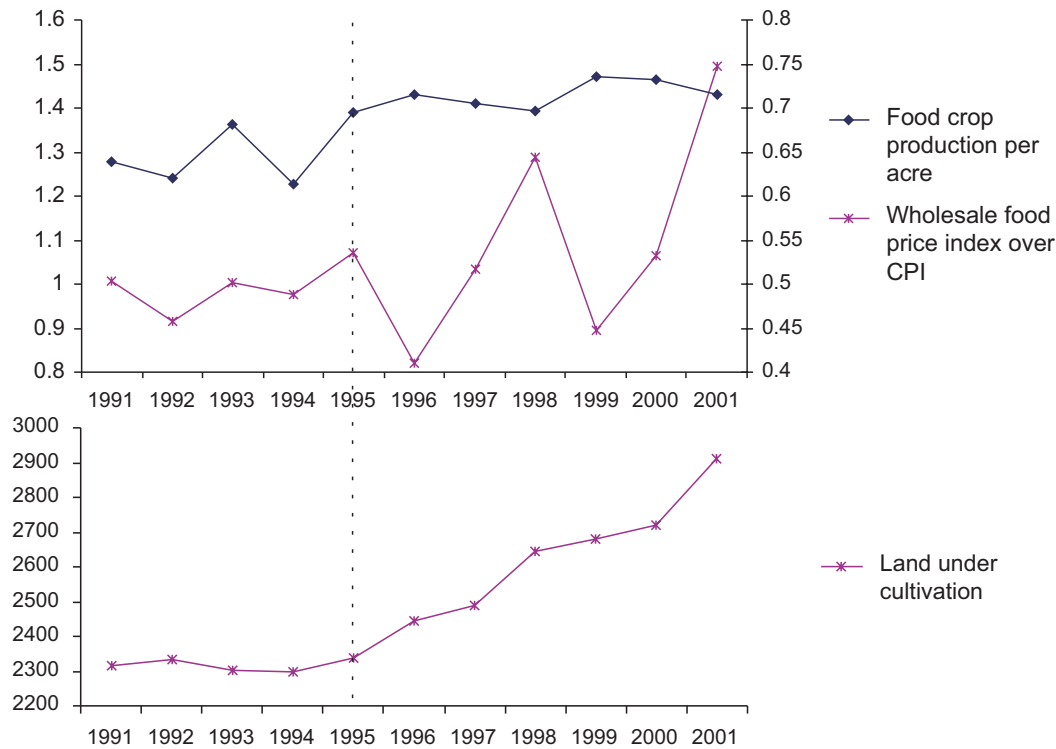


Figure 15: *Food crop production, wholesale price of food crops relative to the CPI and land area under cultivation*

validation period data when estimated with only estimation period data, we can have some confidence in its predictions for the future (or counterfactuals in the past) when estimated using the data of both periods. After having thus identified the functional form, we use ordinary least squares to produce standard errors for the intercepts and elasticities involved.

The first relationship we test is the venerable constancy of the Incremental Capital Output Ratio, that is the hypothesis that output growth is directly proportional to investment. In line with previous research, this hypothesis is not supported by the data.

We then turn to the productive sectors. In agriculture, we observe a price elasticity of substitution between export and nontraded crops of $.42(.15)$; until 1995, land surface under cultivation is approximately constant, and the wholesale price of food crops relative to CPI moves in the same direction as food crop production, suggesting a demand-driven regime. However, starting in 1995, land surface under cultivation begins to grow substantially, and the relative price of wholesale food crops moves consistently in the opposite direction to food crop output, suggesting a shift to a supply-constrained mode (Figure 15).

In industry, the elasticity of substitution between exports and nontraded output turns out to be negative, equaling $-1.00(.23)$. This is not compatible with a neoclassical productivity-frontier description, but fully compatible with a demand-driven nontraded industrial sector. The hypothesis that nontraded industrial output is demand driven is further supported by the behavior of said elasticity when we change the estimation time period or exclude mining from the estimated ratio, as discussed in Kraev [2004b]. Thus, we conclude that the nontraded industrial sector is demand-driven.

Turning to the demand side, we discover that the government was the major source of demand injections throughout the period under consideration (Figure 16). Private savings net of investment were actually positive throughout, thus a net demand drain. As nontraded industry is demand-driven, and most likely so is the informal sector, we conclude that government demand was one of the key drivers of the economy.

The ratio of private disposable income to total private demand (consumption plus investment) was quite stable at about 0.96, suggesting a savings ratio that adjusts to meet investment demand.

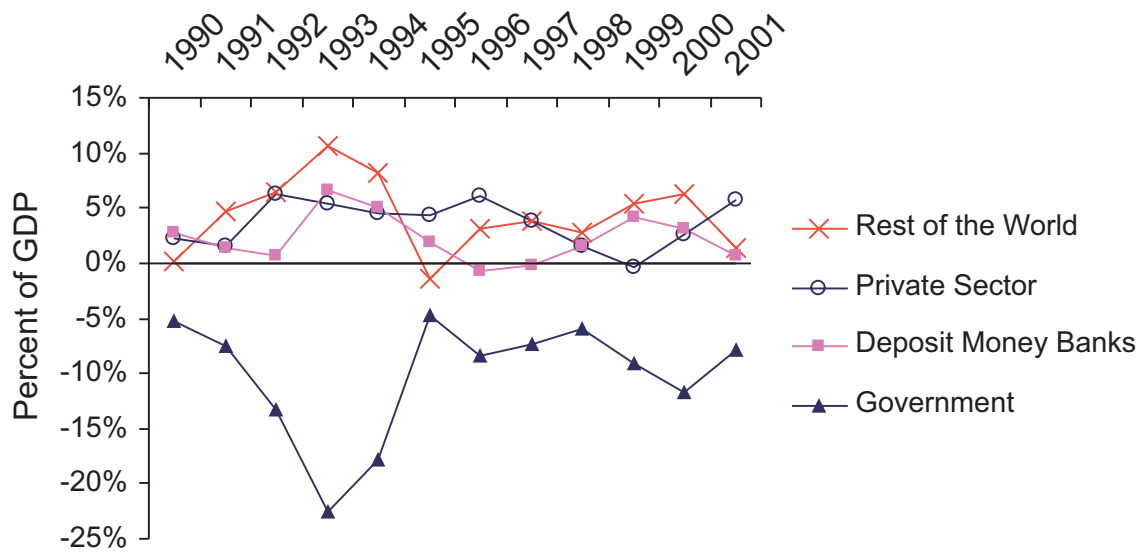


Figure 16: *Net Financial Savings by Institution (as Share of GDP)*. Source: author's estimates from financial stock data.

As far as investment is concerned, we see that investment as a share of GDP has been low (about 15%) and declining; investment demand decreased by about 2% (not percentage points) for each percentage point increase in interest rates.

Finally, turning to import demand, we find a quite large price elasticity of substitution between nontraded and imported manufactures, namely $-1.18(.31)$. This implies that the balance of payments will be quite sensitive to both exchange rate and tariff changes. The corresponding elasticity for services was $-0.38(0.11)$, smaller but still substantial. In addition, imports to nontraded manufactures ratio exhibited an exogenous trend (in log terms), equaling 4% per year when estimated over 1990-1997 and decreasing to 3% when estimated over 1990-2001. This suggests that the opening up of the Ghanaian economy is slowing down but still continuing.

3.4 Applicability of Neoclassical/Monetarist vs. Structuralist Theory to Ghana

The estimates of key macro and sectoral relationships we have discussed in the two preceding sections, such as the various elasticities and the determinants of inflation and money supply growth (all of them complete with significance measures), allow a data-driven comparison of the applicability of the two competing schools, neoclassical/monetarist and structuralist, to the Ghanaian economy.

On the macro/nominal side of things, we observe a very strong link from money supply growth to inflation (a monetarist staple assumption) and a weaker but also significant link from inflation to money supply growth (a common structuralist theme). The two variables thus form a feedback loop, which amplifies by about a third all effects of other variables on either inflation or money supply. While broad money supply growth is the dominant determinant of inflation, the price of fuel and the wholesale price of food crops are also important. Additional influences are growth of monetary base and exchange rate depreciation, both of which impact inflation not directly, but through their effects on broad money growth.

Finally, an increase in interest rates has no direct effect on inflation but produces a small decrease in money supply. That is fully consistent with portfolio balance theory as used by both schools. However, structuralists often assume interest rates to also be a cost-push factor, which is not the case here.

Overall, on the nominal side the monetarist hypotheses are better supported by the data than their structuralist counterparts, but with two important caveats. Firstly, certain cost factors were also important, though less so than money supply growth; and secondly, the relevant money supply measure

was broad money, and not monetary base that is commonly used for that purpose in monetarist CGE models.

On the real side, agriculture is supply constrained while industry is demand-driven - a setup quite common in structuralist models, as opposed to the neoclassical assumption that all sectors are always at full capacity utilization and therefore supply-constrained. On the other hand, import demand is quite sensitive to the relative price of imports vs. nontraded goods, which is a typical feature of neoclassical models, while structuralist models often assume that quantity effects dominate and relative price effects are of moderate importance.

Summing up, on the side of price formation monetarist theory has the upper hand, while on the real/sectoral side of things structuralist theory is better supported by the data. In both cases, however, the optimal description must include elements of both theories.

This is not surprising if we recall that both the structuralist and monetarist theories of inflation and sectoral output, in their extreme forms, are unrealistic abstractions. In the monetarist/Walrasian case, one is assuming full employment and therefore an output that is essentially fixed in real terms. Thus, when money supply grows, leading to increased demand, the only place that demand can go (domestically) is an increase in prices; and output only changes slowly through changes in capital stock. On the other hand, in (early) structuralist models, output is assumed to be demand-driven, so while an increase in money supply still increases demand, this demand is satisfied by increased output, without an impact on prices. As there is thus no channel from the demand side to prices, explanations of inflation have to come from the side of costs, typically through an indexation/distributional conflict story.

Thus speaking in very broad terms, one could say structuralist theories of inflation fit a demand-driven economy, while monetarist theory fits a supply-constrained economy. Unfortunately, an actual economy likely fits neither of the two extremes, but is rather a combination of demand-driven sectors (typically industry and services) and supply-constrained sectors (typically agriculture)². Thus, more recent models of both schools (such as Bourguignon et al. [1991] and Vos [1997], for example) have typically combined fixed-output and flexible-output sectors, resulting in what has become known as fix-flex models.

However, while there is thus convergence between structuralist and neoclassical models regarding sectoral output determination, this convergence has not to date been reflected in a convergence of theories of inflation. While in neoclassically inspired models such as Bourguignon et al. [1991] the monetary base still drives the aggregate price level, structuralist models typically use bottom-up price formation, from which the role of money supply is not immediately visible³.

Therefore, our finding a combination of supply-constrained and demand-driven sectors is fully consistent with the direction of both recent neoclassical and structuralist models. At the same time, our model of inflation, which combines traditional monetarist and structuralist themes, can be regarded as the proper nominal-side counterpart of a real-side fix-flex formulation.

3.5 Are Our Results Generalizable?

Now that we have positioned our results with respect to the dominant theories, let us turn to the question of their applicability to other countries. To what extent are our results Ghana-specific, and to what extent can we expect similar results for other countries?

We would like to argue that our results are typical of a small, open economy with a weak industrial sector, large agricultural and informal sectors, and a shallow financial system.

A combination of a shallow financial system with high nominal and volatile real interest rates means that most investment is self-financed. Therefore, our finding of a savings ratio that adjusts to meet investment demand and does not measurably respond to interest rates is not surprising, and neither is the very weak influence of interest rates on broad money supply.

²By the way, this might be a reason why applied models of the industrialized countries have tended to be demand driven, while models of developing countries, where the importance of agriculture is much higher, have often been monetarist.

³For an in-depth review of structuralist vs. neoclassical/monetarist CGE models, see Kraev [2003].

Another consequence of a shallow financial system (combined with persistent inflation) is that dollar notes are widely used by the populace as a store of value instead of bank accounts, and that quite a high share of private sector financial assets (about a third) is foreign-denominated. This, in turn, accounts for the strong reaction of broad money supply to exchange rate depreciation, as dollar holders suddenly find themselves richer in domestic currency terms.

Turning to price formation, A large, supply constrained agricultural sector means that broad money supply (as the closest proxy for private sector liquidity) and real output of the supply-constrained sector (in our case, nontraded agriculture) are likely to be the most important drivers of the price level, in accordance with the monetarist vision. In contrast to Latin America, the share of the formal sector in overall employment (including both government and industry) is comparatively small in Ghana. Therefore, it is not surprising that the importance of inflation inertia mechanisms such as wage indexation is quite low in our case. . The timing of the various contributions to inflation is also in agreement with other countries, money supply growth taking almost a year to have its full impact, while impacts of cost factors only take a couple of months.

Further, the large informal sector composed mostly of small independent service providers implies a very high transport/retail markup on most items. That, in turn, explains both the importance of fuel prices to inflation (as an important element of transport and production costs) and the lack of immediate reaction of retail prices to exchange rate depreciation (as the increase in wholesale price of imports is in the short term absorbed by the margin of the small retailers). In the medium term, exchange rate depreciation leads to an increase in money supply through revaluation of forex-denominated assets, and that increase in money supply pushes all prices up.

As small domestic retailers thus appear to have little power over the size of their markup on imports, it is natural for them to respond by quantity adjustment - when the exchange rate depreciates and thus reselling exports becomes less profitable, the retailers move more heavily into domestic goods, which accounts for the strong response of import demand to the relative price of imports resp. domestic goods.

Thus we conclude that our empirical results are quite representative of a small, open economy with a shallow financial system, a weak industrial sector, and large agricultural and informal sectors composed of small producers. As that description would apply to many other developing economies, especially in Sub-Saharan Africa, our empirical results and policy conclusions are likely to carry over to them.

The following section discusses the implications of these results for our understanding of the likely effects of macroeconomic and sectoral policies in Ghana during the 1990s, and Section 5 proceeds to use these results to suggest a selection of alternative policies.

4 What were the likely consequences of Structural Adjustment Policies in Ghana in the 1990s?

This section discusses the policy implications of the empirical findings on the structure of the Ghanaian economy that we have discussed in Section 3. We begin by looking at the components of the structural adjustment package one by one, and ask the question whether each of the policy measures therein was likely to have the consequences intended by the program, no consequences, or consequences that were entirely unexpected or opposite to the program intent. Sections 4.8 and 2.7 then summarize the effects of individual policies into a discussion of overall macroeconomic and distributional effects, respectively, of the historical policy package as a whole.

4.1 Decrease government deficit

This measure is supposed to have a plethora of positive impacts. Let's go through them one by one.

Firstly, the resulting decrease in total demand is supposed to improve the balance of payments through decreasing the demand for imports. That is a realistic expectation, as import demand is proportional to GDP, other things being equal. As we have seen that the government was the major

net source of demand, and that a large part of the economy is demand-driven, decreasing government deficit would doubtless be recessionary and therefore decrease the demand for imports. However, this decrease would be transient - as soon as the GDP would start growing again, be it because of government spending or private sector initiatives, import demand would surge right back up. A sustainable decrease in import demand can only be achieved through relative price adjustments and provision of domestic alternatives, both issues we will shortly return to.

Secondly, the decrease in total demand caused by smaller government deficits is supposed to improve the balance of payments by freeing up domestic productive capacity to supply more exports (as the IMF analytical approach, the Financial Programming Framework (FPF), implicitly assumes the total production is unaffected by the stabilization program). This argument is not valid in Ghana. In the case of agriculture, decreasing domestic demand could indeed somewhat stimulate exports, as agriculture is facing an aggregate productivity frontier. However, as food crops are a very large component of aggregate demand, and the relative scarcity of food has been increasing from 1995 onwards, it would take a very large decrease in GDP indeed for such an effect to take place.

In the case of industry, the argument has even less traction as domestic industrial production is demand-driven, thus an increase in domestic production will do nothing to harm exports.

The other hoped-for benefits of government deficit reduction are supposed to work depending on the source of funds to cover the deficit.

If the deficit is financed by borrowing from the central bank, i.e. by printing money, its reduction is expected to contribute towards inflation control. This argument certainly applies to Ghana.

If the deficit was financed by foreign borrowing, its reduction will improve the balance of payments. This argument is correct as far as it goes, as long as the amount of foreign borrowing can be determined by the government. However, in the case of poor countries such as those in the Sub-Saharan Africa, one could argue that the amount of capital inflows (largely consisting of foreign aid) is not directly under the government's influence, and is determined by the donors according to a variety of factors, with high government deficits actually more likely to be branded as "fiscal irresponsibility" and to decrease the aid inflows.

Finally, if the deficit was financed by borrowing from the domestic financial sector, deficit reduction is supposed to free up resources for private investment. This argument's applicability to Ghana is limited in that the actual availability of loanable funds did not appear to be the limiting constraint on investment in Ghana (remember the banks had persistent excess liquidity and saving exceeded investment throughout). The limiting constraints on investment appeared instead to be high nominal interest rates, lack of infrastructure, and lack of investor confidence.

Are any of these three constraints likely to be affected by a government deficit? If the interest rates are determined by the market to be just high enough for the market to accept the outstanding government debt, then a decrease in that debt (or at least in its rate of growth) would indeed have a decreasing influence on the interest rates, and thus stimulate investment. On the other hand, if the decrease in deficit is achieved by curtailing of investments in infrastructure such as roads, then the net effect on investment might well be negative. The final factor, namely investor confidence, is not quantified well enough, and also perhaps too controversial for us to discuss it here.

The final, and in our view most convincing, argument for decreases in government deficits is that such decreases would lead to lower interest payments in the future, and thus leave less funds for more productive uses. That is hard to disagree with (already we see in Figure 5 that domestic interest payments made up the bulk of the deficit in the late 1990s), but is also less imperative than some of the other arguments, as we are explicitly forced to weigh off a decrease in today's government services against a decrease in future government services.

Summing up this somewhat lengthy section, in our opinion the only convincing macroeconomic arguments for control of government deficit in Ghana are firstly, the need to control growth in money supply so as to control inflation (applying to debt financed by borrowing from central bank), secondly, the need to keep the interest rates reasonably low (applying to debt financed by borrowing from the domestic banking system, and only if the interest rates are market-determined so as to accommodate the government debt), and thirdly, the need to keep future interest payments reasonably low.

4.2 Curtail support programs such as input procurement and input subsidies for agriculture

One of the measures to achieve a reduction of government deficit was a reduction or cancellation of government programs such as input procurement and input subsidies for agriculture. Besides the positive revenue impact, an intended consequence was to create a space for the private sector to fill that niche instead of the government, supposedly leading to greater efficiency.

In our view, that policy has achieved the reverse of its intended purpose. First of all, the private sector has apparently not sprung up to fill the gap, according to both the references in Section 2 and to the fact that since 1995, Ghana's food crop supply was increasingly scarce (as indicated e.g. by the ratio of wholesale food crop price to CPI in Figure 15). This can be expected to have a row of adverse consequences. Firstly, as most of the poor in Ghana are food farmers, and most of the food farmers are poor, reduction in government support of agriculture has directly hit the poorest segment of society.

Secondly, as food production has not been able to keep up with demand, it is very likely that the shortfall was made up through imports. That, in turn, led to a worsening of the balance of payments and therefore higher depreciation rate. Our econometrics suggest that about a quarter to a third of Ghana's broad money supply is foreign currency-denominated, the increased depreciation translated into increased money supply growth and thus directly into higher inflation. Thus we come to the conclusion that curtailing government support of agriculture could well have damaged agriculture and *still* led to higher, or at least not lower, medium-term growth of money supply and inflation.

Our argument here worked the way it did because agriculture is experiencing an aggregate supply constraint. The story for domestic industry, which is demand-driven, is quite different, as we will see in the discussion of current account liberalization.

4.3 Reduce money supply growth

This is supposed to control inflation. While the connection between money supply growth and inflation is contested theoretically, our econometric investigation of the Ghanaian case leads us to conclude that broad money supply growth is indeed the key driver of inflation, as illustrated by the decomposition of Figure 14. Our econometrics show that an increase in broad money supply translates almost one-to-one into a CPI increase (with the impact spread over a year and a half), in agreement with the constant velocity of money hypothesis that the monetarists (including the IMF) normally use.

Furthermore, it appears that the exchange rate's influence on inflation also works through the money supply (revaluation): as the exchange rate depreciates, the local currency value of foreign currency-denominated assets grows, increasing the total money supply and thus inflation (at a rate of about 0.31% total extra inflation per 1% extra depreciation, spread over about a year).

Thus, control of broad money supply is indeed the key to inflation control in Ghana. The question then is what level of inflation is to be targeted; this a question of policy choice rather than theory and thus cannot be decided in isolation, but must be weighed off against other policy goals. Now that we have econometric estimates of the strength of the connection, it becomes possible to discuss tradeoffs between inflation and other policy targets.

4.4 Increase Interest Rates

There are three often quoted reasons for increasing interest rates (meaning in the first instance interest rates on government bonds, but deposit and lending rates broadly follow the bond rates). Firstly, increasing the interest rates is supposed to stimulate savings, and thus provide more funds for investment. However, as in the case of Ghana the constraining factor is investment demand, not savings supply, increasing interest rates is counterproductive for stimulating investment.

Secondly, high interest rates are supposed to prevent excessive depreciation of the currency, according to the Uncovered Interest Parity theory of interest rate formation. Unfortunately, the impact of interest rate on the exchange rate was *positive* in the regressions we ran. Thus at least in the

Ghanaian case high interest rates do not appear to be a useful instrument for combating exchange rate depreciation.

Finally, high interest rates are supposed to lower the growth of money supply, with the consequences for inflation as discussed above. While controlling the growth of money supply is indeed a worthy goal, in the case of Ghana our econometrics indicate a very weak response of broad money supply to interest rates, with an interest rate increase of ten percentage points resulting in a one-time reduction of 8% in the money supply. The likely reason for that is a very thin financial system, resulting in little “portfolio rebalancing”. Apart from its small magnitude, the money supply response to interest rates only happens at the time they are being raised; keeping them high thereafter has no influence on subsequent money supply growth rates, but has adverse effects on investment, as well as on the expenditure on interest payments by the government.

This latter side effect of high interest rates is directly in opposition to one of the goals of lowering government deficits, namely, lowering government interest payments. If interest rates on government debt are pushed above the market-determined rate, the cost of servicing that debt also goes up, reducing funds available to the government for other purposes.

Summing up, increasing interest rates (beyond the market-determined rate necessary to accommodate the government debt to the domestic banking system) is not an effective tool either for control of money supply growth or for support of the exchange rate. However, it has substantial negative consequences: depressing investment, increasing government interest payment obligations, and creating inflationary pressures.

Turning from theory to practice, monetary policy in Ghana during the ERP was fortunately not as tight in practice as in rhetoric, as Figure 6 shows. Especially in the 1980s and first half of the 1990s, real interest rates were rarely above 10%, and quite frequently negative, due to high and volatile inflation. Low real interest rates did not encourage investment, however, as the volatile inflation and exchange rates made for a very risky environment; but interest rates as such were not to blame for that.

However, the picture seems to be changing in the late 1990s, with inflation subsiding and real interest rates consistently remaining over the 10% mark. If inflation can indeed be contained, care must be taken to take nominal interest rates down accordingly, lest investment strangulation through inflation and exchange rate volatility be replaced by strangulation through too high real interest rates.

4.5 Introduce floating exchange rates and depreciate the currency

The resulting increase in domestic prices of exports and imports is supposed to make exports more competitive and to redirect demand away from imports. The overall reduction in domestic demand from reductions in government spending is supposed to make sure there is nonetheless no excess demand for domestic goods.

The first observation we can make is that a floating exchange rate was not a successful instrument for stabilizing real exchange rates; in fact, as Figure 11 helps to illustrate, nominal exchange rate volatility was the cause of most of the volatility in the real exchange rate; nominal exchange rate depreciation tended to lag behind inflation for several years and then correct itself in one huge slide - hardly a recipe for macroeconomic stability.

Nevertheless, our opinion regarding the floating of the exchange rate is that Ghana really has no choice in the matter. Firstly, given the persistent foreign currency shortage, the Bank of Ghana does not have enough reserves to withstand even a mild currency attack, so fixing the exchange rate is not an option. Secondly, import demand is very responsive to relative prices, so Ghana couldn't afford an overvalued exchange rate even if it could maintain it. A sad example is the end of our period: during years 1997-1999, Bank of Ghana intervened (quite mildly) to prop up the exchange rate, leading to its progressive overvaluation. The result was that just as the Bank of Ghana ran out of reserves in 1999, a terms of trade shock occurred, leading to a particularly nasty depreciation (“freely falling”) episode.

So it seems to us that the only way Ghana could reverse the floating of the cedi is by completely reversing current and capital account convertibility reforms - not by a long way politically feasible

even if it was desirable.

Once we accept that there is currently no viable alternative to the floating exchange rate regime, the tendency of the exchange rate to have freely falling periods is still quite damaging and should be avoided, if possible. The only two ways to combat that that we can suggest is firstly, for the central bank to refrain from propping up the currency, hopefully leading to more gradual depreciation regimes; and secondly, achieving a viable balance of payments position in the medium term. As long as the trade account, not even counting the debt service payments, is in the deep red, we cannot expect any currency stability. We will further discuss exchange rate policy in Section 5.

4.6 Liberalize the current account and reduce price distortions

According to Aryeetey and Harrigan [2000], liberalizing the current account had the following goals: narrow the gap between official and parallel exchange rate, provide foreign exchange to ease import strangulation, achieve a viable balance of payments position, clear up arrears, and introduce current account convertibility.

With the exception of a viable balance of payments, the objectives appear to have been largely achieved. In general, guaranteeing a sufficient supply of capital goods and intermediate inputs is quite essential for Ghana, whose primary and secondary sector are not self-sufficient in either of these. The jump of GDP growth rates from the first five years of the 1980s to the next five years after that was in fact due primarily to capital goods and intermediate input availability, along with huge aid inflows that financed these.

While availability of imports necessary for production was doubtless a good thing, the concurrent glut of final goods is a different thing altogether. This is best discussed in the context of the next policy measure, namely elimination of price distortions.

“Eliminating Price Distortions” refers to abolishing import quotas and reducing import tariffs, while reducing subsidies to domestic producers. As a combination of tariffs and subsidies can easily be self-financing, it is not quite obvious to us what practical benefits such a policy is supposed to carry; what follows is the best we can do to make sense of the arguments presented.

The usual theoretical arguments are Pareto efficiency and comparative advantage. Yet comparative advantage theorems all presuppose a closed capital account; and the practical benefits of Pareto efficiency are not at all clear to the author. Clearly, absurdly high tariffs (say, several 100%) can have almost the same adverse effects as abolishing imports altogether; but the same can hardly be said for tariffs of several dozen percentage points. Sometimes it is also argued that lower prices for imports benefit consumers; however, as at the same time higher import consumption means less income to domestic producers (especially after taking into account the multiplier effects), this argument is not tenable without further refinement.

We have already discussed the subsidies on agricultural inputs; let us now turn to tariffs on manufactured goods. As we have mentioned in Section 3, the domestic nontraded manufacturing sector is demand-driven, and the distribution of overall demand for industrial output between imports and domestic goods is quite responsive to their relative price. Therefore it is safe to assume that the elimination or lowering of import tariffs had several adverse impacts: firstly, it negatively affected a source of government revenue; secondly, it worsened the balance of payments through increased demand for imports; and finally, it depressed domestic manufacturing, thus lowering the national income. As domestic manufacturing is *not* supply-constrained but demand-driven, depressing manufacturing of goods for domestic consumption did *not* contribute to increasing exports.

Summing up, liberalization of the current account was a quite important policy measure for reviving domestic production, and was largely successful and beneficial. The major exception is the elimination of protection of domestic industries through lowering of tariffs on imported manufactured final goods. This measure had several adverse consequences without bringing any benefits visible to the author.

4.7 Liberalize the capital account

Allowing a higher measure of capital mobility is expected to attract more funds for investment. The most-cited adverse effects of opening up capital accounts are capital flight and boom-bust cycles in

the credit markets, Latin America providing an abundance of examples for both. A further theoretical criticism [Daly 1996] is that arguing for capital account liberalization is logically incompatible with comparative advantage arguments, as the latter are premised on closed capital accounts.

Unlike Latin America, Ghana does not provide much evidence for either of these adverse effects, nor indeed of the expected benefits. Net private transfers into Ghana are positive, owing mainly to remittances from Ghanaians working abroad. Capital flight does not appear to be a major issue, possibly because there was not much capital there to begin with; and the banking system is too thin, and the economy too little industrialized, for credit markets to develop substantial own dynamics that could strongly affect the rest of the economy.

On the side of expected benefits, the only major result appears to be the large investments by foreign-owned mining companies. However, as these investments mainly go towards buying capital goods (not produced in Ghana), the constraints on profit repatriation are weak, and the linkages between the mining sector and the rest of the economy are also quite weak, the net benefit to Ghana from the foreign investment in mining appears to be limited at best.

After discussing each of the structural adjustment policy components in detail in Sections 4.1-4.7 above, we now proceed to pull all the threads together. Sections 4.8 and 2.7 summarize the effects of individual policies into a discussion of the overall macroeconomic and distributional effects, respectively, of the historical policy package as a whole.

Sections 4.8 and 2.7 do not add any new ideas to the in-depth discussion of the previous sections. Their purpose is rather to convert the point-by-point analysis of the previous subsections into a more compact, unified narrative.

4.8 Overall Macroeconomic Impacts

This section discusses the reasons for Ghana's poor macroeconomic performance in the 1990s, as compared to the late 1980s, specifically its lower GDP growth rate, balance of payments problems, and persistent inflation.

Let us first consider the reasons for the upsurge of the late 1980s. We would say that there are three major reasons: firstly, a major inflow of foreign aid released the acute foreign exchange strangulation that the country was subject to in the beginning of the 1980s, allowing for extensive imports of capital goods and productive inputs. This stimulated domestic production across the board, as these productive inputs were at that point its main limiting factor. Secondly, the aforesaid inflow of foreign aid also served to stimulate domestic demand through multiplier effects. Finally, more reasonable current account policies (such as devaluing the exchange rate to a realistic value) and larger producer prices offered to cocoa farmers, among with other export promotion policies, led to an increase in export supply.

The side effects of that scenario were firstly, a buildup of foreign debt, as export supply could not catch up with the import demand, especially as the latter was stimulated by GDP growth; and secondly, a surge in inflation from the demand stimulus.

Unfortunately, the scenario as outlined above was not sustainable. On the one hand, as the economy became more and more open, exports and imports continued to grow at about the same rate. However, as they were starting from baselines differing by almost a factor of two, the result were persistent trade deficits. As the interest payments on the growing foreign debt also mounted, and the abnormally large aid inflows of the 1980s were not sustained into the 1990s, the "Rest of the World" became, and remained throughout the 1990s, a net demand *sink*, so that now the multiplier effects from the balance of payments worked to *lower* GDP.

Let us now turn to sectoral output. As imported inputs and capital goods became freely available, they were no longer the limiting factors in industrial production; the limiting factor now was low demand (capacity utilization of medium and large factories was around 50% in 1990-1993). Unfortunately, due to the high degree of trade openness of Ghana in that period, any factor that increased demand for domestic manufactured goods also increased demand for imports, so that stimulating domestic industry was only possible at a cost of an even worse balance of payments. This was in fact

what happened in 1992-94 (1992 being an election year), when the government ran massive deficits, pushing up money supply growth and further worsening the balance of payments (Figure 16).

Unfortunately, even such transient stimuli were negated by very high nominal interest rates (over 40% being not unusual) that aimed to counter the inflationary consequences of the aforementioned money supply growth. While our regressions indicate that inflation control through interest rates probably was not very successful, it does seem that the combination of high nominal interest rates with high, volatile inflation further depressed the already-low investment-to-GDP ratio.

Turning to agriculture, we conclude that while the initial availability of imported inputs was beneficial, the elimination of government subsidies and procurement services largely negated these benefits. Thus, there was no basis for a sustainable growth in the agricultural sector, and local food supply became increasingly scarce. Though the level of disaggregation of import data does not allow us to directly verify that hypothesis, it seems very likely that shortage of locally produced food crops directly contributed to a larger import demand and thus to balance of payments worsening. The cocoa farmers were positively affected by higher cocoa purchasing prices, but as agriculture was now on a productivity frontier, reallocation of labor towards cocoa supply further contributed towards food crop scarcity.

Having thus understood GDP growth and balance of payments problems, let us turn to the persistent inflation. In Section 3 we have seen that the major driver of inflation was money supply growth, amplified by the money supply/price level feedback loop, so that the medium-term impact of one percent extra money supply was about one percent extra inflation, corresponding to the monetarist predictions. While government borrowing did of course play an important role in money supply growth, an equally important factor was revaluation of the foreign exchange-denominated component of the money supply. Judging by our regressions, about one third of the money supply is foreign currency-denominated, so that for example a 3% depreciation would lead to a 1% increase in money supply and thus an about 1% increase in the price level, spread over about a year.

In contrast to money supply changes that take about 9 months to fully translate into price level increases (and to depreciation, whose influence on inflation also works through the money supply), the impact of wholesale food crop prices and fuel prices on inflation was almost instantaneous, taking one to three months. We would conjecture that this leads to higher visibility of inflation due to these causes, and thus to their relative prominence in inflation discussions.

Having thus painted a picture of what we think actually happened in the 1990s, let us proceed to formulate some policy recommendations.

5 Policy Suggestions

In this section, we formulate a set of policy recommendations that would retain the positive aspects of the historical policies while improving upon them in the areas where they were deficient. As we have seen in Section 2, the Ghanaian economy did not undergo any dramatic structural change during the 1990s, therefore these policy recommendations are likely to be applicable to the present day as well.

The problems Ghana faced in the 1990s were a result of several interlocking issues, most importantly a persistent trade deficit, a government that indulged in high deficits in election years, a supply-constrained agricultural sector, a manufacturing sector strangled by high nominal interest rates and low demand due in part to competition from imports, and money supply that had a large foreign currency-denominated component.

This led to other problems, such as external and internal debt buildup and persistent inflation and currency depreciation. Clearly no single recommendation will suffice to tackle that complex of issues; however, we believe that the package presented here goes a long way towards addressing most of them. Not surprisingly, it involves some easy gains and some tough choices.

5.1 Trade Policy

We would argue that one of the most crucial issues to tackle is the balance of payments deficit. As long as it persists, foreign debt buildup and thus further hemorrhaging of interest payments will have

negative impacts on government finances as well as aggregate demand. Furthermore, the ensuing continuous currency depreciation will result in higher inflation, with a strong possibility of increased use of foreign currency as a store of value and even in everyday transactions. As the share of foreign currency in the overall broad money supply would grow, the impact of depreciation on inflation would become ever stronger in a positive feedback loop, leading to higher inflation and possibly eventual effective dollarization of the country, robbing the government of the ability to use monetary policy as an instrument, an ability it still possesses now.

The balance of payments deficit must be tackled from both sides, import demand and export supply. We will discuss export supply below among the sectoral policy recommendations; let us now turn to import demand.

There are two possible reasons for an increase in import demand: firstly, a relative price shift making imports more attractive, and secondly, the inability of domestic producers to satisfy demand, leading to forced substitution. Insufficient domestic supply can only be addressed by supply-side measures and is thus discussed in the sectoral policies section. Here we only note that it is more likely to be relevant for the supply-constrained agriculture than for the demand-driven manufacturing.

Let us now turn to the influence of relative price on import demand. We have mentioned in Section 3 that the relative price elasticity of demand for industry imports is about -1. Thus, import demand responds strongly to relative price and a moderate increase in tariffs on manufactured consumption goods would be effective in lowering import demand, increasing demand for domestic industry as well as raising extra revenue. That would appear to us one of the easy, low cost/high gain measures. The key to doing it right is firstly, restrict the tariffs to final goods and the few capital goods for which domestic substitutes are readily available; secondly, keep the increases moderate; and finally, restrict the demand-redirecting measures to manufactured goods (as opposed to agricultural produce).

While this is not by itself a sufficient measure, it would provide fast balance of payments relief while stimulating import substitutes; whereas the equally necessary measures to expand export supply would take several years to kick in.

Note that reining in the share of imports in GDP is necessary; a mere expansion of exports (even if all the foreign exchange generated thereby accrues to Ghanaian firms and nationals) would lead to an increased GDP via the multiplier effects, and thus to a proportionate increase in imports, to a large extent negating the positive balance of payments effect of increased exports.

5.2 Sectoral Policies

While moderate tariffs on manufactured final goods imports will provide a degree of balance of payments relief and stimulus for domestic manufacturing, over the medium term it is necessary to expand the supply of exports and import substitutes.

First, consider industry. We have seen that interest rates are not an effective tool of monetary policy, while high interest rates are a serious impediment to investment. Therefore interest rates should be market-determined, and therefore positive in real terms and large enough to accommodate the substantial government debt, but not any higher than that. This should go a long way to stimulate investment and manufacturing for domestic consumption.

As industry as a whole is not supply-constrained, any program of support of export industries needs to be specifically targeted to reach these, rather than the whole of the secondary sector. As non-traditional exports are by far the fastest growing export component, the optimal approach to industrial export support is likely to consist in programs specific to each export sub-category, rather than broad macroeconomic measures of the kind that we discuss here.

In agriculture, on the other hand, the binding constraint is not demand deficiency but an aggregate supply deficiency. As at this point export crop and food crop production actually compete with each other for the total productive capacity, agricultural policies should aim to expand the productivity of the sector as a whole. Thus, the optimal policy interventions would be in provisions of infrastructure such as roads and storage facilities, along with credit and reinstatement of input procurement programs and input subsidies. If it is deemed essential that the latter is done by the private sector, then that should be achieved by first making sure the private sector solution works in parallel to the government-

run system and only then dismantling the latter.

5.3 Fiscal Policy

One of the first questions that any policy proposal must address is its own financing. How should the above sectoral interventions be paid for?

Firstly, let us note that a substantial part of the cost of export promotion and agricultural support programs could be paid for by the proposed import tariff. Secondly, we need to remember that depreciation has a substantial impact on money supply growth. Therefore, policies that expand exports (or production of domestic food crops, leading to smaller food crop imports) and thus improve the balance of payments will lead to smaller depreciation and therefore decrease the rate of broad money supply growth. Thus it is quite feasible that cost-effective agricultural support measures, even if partially financed by money creation, might actually lead to lower money supply growth *and* better balance of payments, once the influence of lower depreciation rates is taken into account.

Having said this, it is still true that inflation in Ghana is extremely responsive to money supply growth, so there is a very strong argument for trying to keep the latter down. However, inflation control targets must be weighed off against the other policy targets, rather than treated as an overriding objective.

5.4 Exchange Rate Policy

While we were admittedly not as successful in explaining the exchange rate behavior through econometrics as was the case with the other relationships, it appears that in broad terms the exchange rate responds to the relative price of domestic goods vs. imports and to the relative abundance of foreign exchange reserves.

Further, the apparent pattern of exchange rate movements was a series of periods when depreciation rate was fairly stable and lagged behind the rate of inflation, alternating with quite violent “freely falling” strong depreciation periods that re-aligned the relative prices while causing another surge of inflation. There were two freely falling episodes during our period. The second happened after a period of attempted exchange rate stabilization by the Bank of Ghana, and was the larger of the two.

The message that we extract from that is that the Bank of Ghana should under no circumstances attempt to prop the exchange rate up. Besides being costly to maintain and immediately increasing import demand, an overvalued exchange rate will correct itself anyway once the Bank of Ghana runs out of reserves, and the ensuing depreciation will be all the stronger for the delay.

In fact, in our view the problem of choosing the right intervention strategy in the exchange rate market might be likened to the optimal strategy of forest fire management. Just as in our case inflation gradually accumulates to make an exchange rate overvalued (even though the latter supposedly floats), the dry wood in the forest accumulates and increases the fire hazard. If one tries to suppress every fire using all the resources one has, eventually there will be enough dry wood around to make the next fire too big to quench, and that maxi-fire could well cause more damage than all of the smaller ones we had suppressed. Instead, the correct method of fire management consists in igniting smaller, controllable fires on purpose as soon as there’s a little dead wood around, and thus keeping the fires small.

Likewise, it might be worth while to consider an exchange rate policy that is based on watching some relative price indicator such as ratio of retail prices of imported vs. domestically produced manufactures, and intervenes to *depreciate* the exchange rate at first signs of overvaluation. There would be several positive consequences to such a strategy: firstly, one could hope to avoid the damaging maxi-depreciations that happen every so often in the “normal” course of affairs. Secondly, that little extra depreciation would help lower imports via relative price effects, thus reducing future depreciation pressures; thirdly, rather than losing money on propping the exchange rate up, the Bank of Ghana might actually make a bit of a profit while keeping it at a more realistic level.

The only downside would be higher import prices; however, slightly higher but more stable prices of imports might well be better for local businesses and consumers than occasionally lower but more volatile prices.

5.5 Monetary Policy

One of the surprises that has emerged from our regressions is that during the period we investigate the interest rates were nearly useless as an instrument to control money supply growth. Thus the interest rates should be kept as low as the domestic credit market would allow while still being able to absorb the outstanding government debt.

Therefore, the major instrument of monetary policy available to the Bank of Ghana is control of the monetary base, especially of money creation from lending to the government. This should be used with caution, as already discussed in the fiscal policy section.

6 Conclusion

In the late 1980s, Ghana was widely touted as a successful implementer of the standard Structural Adjustment blueprint, including elimination of subsidies, opening to trade and capital flows, floating the exchange rate, and high interest rates. The growth rate of the Ghanaian economy had surged up from the crisis of the early 1980s, the exchange rate regime was successfully liberalized, and export earnings were growing. However, in the 1990s, the growth rate of the economy diminished, capital formation remained low, current account deficits persisted, and a high inflation rate was combined with periods of “freely falling” exchange rates and mounting foreign and domestic debt.

We investigate the reasons for this poor performance, providing a quantitative analysis of macro and sectoral behavior of the Ghanaian economy in the 1990s, along with a first cut at an assessment of its distributive impacts. We begin by assembling a yearly time series of Social Accounting Matrices for the period 1990-2001, and a monthly series of financial stocks, arranged in Financial Accounting Matrices, for the same period.

We then use econometric analysis (ARIMA-X) to understand the behavior of Consumer Price Index, broad money supply, and the exchange rate (all of these being monthly series). To analyze sectoral behavior, for which only yearly data is available, we formulate hypotheses based on Computable General Equilibrium model theories, and test them using validated least-squares optimization.

We find that the agricultural sector was supply-constrained while the industrial sector was demand-driven. Investment to GDP ratio was low and mildly falling, and the savings ratio was passively accommodating investment demand, with no measurable impact of interest rates on savings supply. Relative price elasticity of import demand was quite high, slightly exceeding unity.

On the nominal side, CPI inflation could be explained quite well by broad money growth combined with wholesale price of food crops and price of fuel, broad money growth being the dominant factor. Broad money growth was in turn explained by growth of monetary base, exchange rate depreciation, and CPI inflation. The influence of the interest rate on treasury bills on broad money was also statistically significant but so low as to make interest rates almost useless as an instrument to control money supply growth. Nominal exchange rate, far from being a stabilizing influence on the real exchange rate, exhibited a mixture of “floating” and “freely falling” periods, with central bank attempts to stabilize it only resulting in a worse “freely falling” period slightly later on.

The policy recommendations we derive from that is firstly, for the government to pursue a tight fiscal and loose monetary policy; secondly, to prevent excessive recessionary impacts from the former, we recommend moderate import tariffs on imported manufactured final goods, combined with selective support of exporting industries. On the other hand, in agriculture, where the supply constraint and not the demand level is binding, we recommend broad support measures such as infrastructure, credit, and supply of subsidized inputs. The resulting increase in exports supply and decrease in import demand will improve the balance of payments, lowering the rate of exchange rate depreciation. As exchange rate depreciation and wholesale food crop price inflation are, after growth in monetary base, the second most important drivers of overall inflation, this package will also lead to inflation control.

Comparing our findings with typical assumptions of the two leading schools of CGE models, neoclassical/monetarist vs. structuralist, we find that on the side of price formation monetarist theory has the upper hand, while on the real/sectoral side of things structuralist theory is better supported by the data. In both cases, however, the optimal description must include elements of both theories.

Are these results particular to Ghana in the 1990s, or are they more broadly applicable? First of all, the structure of the Ghanaian economy has not changed much since the 1990s⁴. Thus, our policy recommendations are likely to be valid not only for the 1990s, but also for the present.

As far as applicability to other countries is concerned, our empirical results are representative of a small, open economy with a shallow financial system, a weak industrial sector, and large agricultural and informal sectors composed of small producers. As that description would apply to many other developing economies, especially in Sub-Saharan Africa, our empirical results and policy conclusions are likely to carry over to them.

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⁴The only exception that the author is aware of is introduction of secondary market for treasury bills, which is likely to increase the importance of interest rates as a monetary policy instrument.

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