Non-marginal Price Changes: Conditions for the Success of Floating Exchange Rate Systems in Sub-Saharan Africa[1]

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1. Background — Destabilised Exchange Rates

Starting in the early 1980s, a number of countries in Africa chose or were forced to increase the official price of foreign exchange by 100 per cent, or more, as part of a major shift in macroeconomic policy. The rate was not fixed after the initial devaluation, but was determined by market forces.[2]

Those countries which made this change long enough ago for evidence to be available already, then found that the domestic cost of foreign exchange increased further, sometimes rapidly. In other words, the initial large depreciation was followed by further depreciation. This second phase of depreciation was in some cases larger than the original one, and showed few signs of ending.[3] Some examples of this process are shown in Table 1.

Table 1 **Increase in the Domestic Cost of Foreign Exchange**

	Initial cost increases (over previous quarter)		*Additional increase to 1987*[a]
Ghana	1983 (4)	982%	397%
Nigeria	1986 (3)	107%	22%
Sierra Leone	1985 (1)	132%	777%
Tanzania	1986 (2)	151%	47%
Zaire	1983 (3)	350%	255%
Zambia	1985 (4)	160%	268%

Note: a Data for March 1987 where possible; otherwise, the latest available month.

Source: International Financial Statistics.

The initial large devaluations had a number of objectives. One common objective was to 'stabilise' the economies of the countries concerned. Prima facie, Table 1 suggests that exchange rates may have been *destabilised*; at worst, some economies may have entered a process of accelerating devaluation and inflation. However, floating exchange rate regimes were chosen in part to avoid the inflexibility of fixed rates, so that some further devaluation may have been appropriate. Moreover, the policy packages of which large devaluations were a part had other objectives. Before categorising exchange rate auction systems as having failed, therefore, the success of other objectives should be examined. Some of that evidence is not as up to date as the data on exchange rates. One of the symptoms of economies under economic stress is delay in producing official statistics. But enough evidence is available to make a start.

2. Success in achieving Other Objectives

(a) Recovery of Exports

One of the main objectives of devaluation was to provide incentives to increase export earnings. Typically export earnings had declined, in most cases severely, and it was argued that their decline was caused by an earlier failure to devalue. Table 2 shows the extent of the decline in export earnings prior to the initial large devaluations identified in Table 1, and, where statistics are available, what happened to export earnings afterwards.

[1] This paper was written to form the basis of a research proposal which would incorporate case studies of several African countries which have changed their exchange rate policies.

[2] Foreign exchange controls were not all removed. But there was a major shift towards a legal market-determined rate in each case.

[3] Zambia made several attempts to stop the process, and returned to a fixed rate in 1987.

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Table 2

US Dollar Export Earnings before and after Devaluation

	Pre-devaluation[a]	*Change in export earnings* *One year after*	*Two years after*
Ghana	-58%	+29%	+12%
Nigeria	-52%	n.a.	n.a.
Sierra Leone	-63%	-10%	+3%
Tanzania	-50%	n.a.	n.a.
Zaire	-16%	-7%	-5%
Zambia	-48%	n.a.	n.a.

Notes: a this column shows the fall in export earnings from the highest annual level in the five years prior to the large devaluation identified in Table 1.

n.a. — not available.

Source: International Financial Statistics.

Only Ghana was able to increase exports after the initial devaluation. Sierra Leone and Zaire showed further declines.[4] It was too early for there to be any evidence for the other countries. Each of the six countries suffered an import squeeze prior to devaluation. Imports (in current US dollar terms) fell by 43 per cent on average from their highest point in the previous five years. But Ghana, Sierra Leone and Zaire showed some sign of an increase in imports in the next two years. This suggests that the policy change may have released some additional sources of credit, since Ghana was the only one of the three in which export earnings rose.

(b) Reduction in Budgets Deficits

The IMF and the World Bank identified rapid growth of the public sector, and its inefficient management, as 'important reasons for the economic difficulties facing sub-Saharan Africa' [World Bank 1986:21]. Reductions in public sector deficits were therefore an important part of the policy packages of which non-marginal devaluation formed a part.

A simple comparison of government budget deficits, either as a percentage of total spending or as a percentage of GDP, shows that the six sample countries had widely varying deficits (Table 3 below). Moreover, only in Sierra Leone was the deficit as a percentage of GDP above the average for sub-Saharan Africa.[5] Only in Ghana was there any significant improvement in the deficit after the devaluation.

Other public finance problems existed. They were to be found either in the way that deficits were financed, or in the deficits of parastatals, as much or more than in central government budgets. For example, the average increase in central bank lending to the government in the six sample countries was 84 per cent in the year before their large devaluations, with a range from 29 per cent (Sierra Leone) to 139 per cent (Ghana); and the large deficits of Tanzania's agricultural marketing parastatals were financed by the commercial banks to the point where their accumulated debt in 1984 was some 30 per cent of the money supply.[6] Parastatals in Nigeria and Sierra Leone were also loss-making.[7]

(c) Control of Inflation

For a nominal devaluation to result in a real devaluation, domestic inflation had to be controlled. Roughly speaking, domestic inflation (adjusted for inflation in the country's trading partners) had to be less than the devaluation. If this was not achieved, then there would be no price shift in favour of producers of tradeable goods and services, and all that would have been achieved would be a continuing imbalance at a higher rate of inflation than before.

Table 4 shows that, in the four sample countries for which statistics are already available, a lower rate of inflation than the devaluation was achieved. Inflation in the year after devaluation was less than the

[4] Other factors affected exports earnings, notably export price changes. In Ghana's case, however, the cocoa price changed little over the relevant period.

[5] In the latest year for which an average is available, 1982, it was seven per cent [World Bank 1986:98].

[6] Parastatal debt from Ellis 1987, money supply from IFS.

[7] Negative net worth of 20 per cent (1983) and 22 per cent (1982) respectively, based on World Bank analysis [Temple Barker and Sloane Inc. 1985].

Table 3

Budget Deficit as per cent of Total Spending: before and after Large Devaluation
(as per cent of GDP in brackets)

	Year before devaluation	*Year after devaluation*	*Two years after*
Ghana	33% (2.7%)	18% (1.8%)	16%
Nigeria	14% (4.8%)		
Sierra Leone	44% (7.4%)	53%	
Tanzania	24% (5.8%)		
Zaire	11% (3.0%)	10%	
Zambia	35% (6.5%)		

Notes:
a The numbers in Table 3 include the combined effect of attempts to reduce government spending and the impact of devaluation on tax revenue; treating them separately would be difficult because of the impact on nominal statistics of rapid rates, and rapidly changing rates, of inflation.

b Deficits in first column expressed as a percentage of total spending and net lending of the central government; for Nigeria, figures only available for federal spending, for 1985 (the large devaluation was in the last quarter of 1986).

c Deficit as per cent of GDP in Nigeria for 1984.

Sources: International Financial Statistics; Central Bank of Nigeria Annual Report 1985.

Table 4

Comparison of Devaluation and Inflation

	Inflation		
	Year before devaluation	*Year after devaluation*	*Initial increase in forex cost*
Ghana	123%	40%	982%
Nigeria	n.a.		109%
Sierra Leone	67%	77%	133%
Tanzania	33%		151%
Zaire	77%	52%	359%
Zambia	37%	32%[a]	157%

Note: a Annualised rate for first six months after devaluation.

Source: as Table 3.

percentage increase in the cost of foreign exchange. International inflation was low in the relevant period,[8] so that the important comparison was between domestic inflation and devaluation.

Table 4 shows only that real devaluation occurred, not whether it was large 'enough'. The amount of real devaluation required to compensate for previous overvaluation, or to provide enough price incentives to restore balance of payments equilibrium and allow enough imports for resumed economic growth, would require much more detailed analysis. These issues are discussed further below.

2. Reasons for Failure — Prescription or Technique

It would seem that there were two underlying reasons for choosing to float the foreign exchange rate, whether by auction or by some other means, rather than to devalue and then repeg the exchange rate at a new level. These are, firstly, the problem of picking the correct initial change in the rate, and secondly, that of

[8] Export unit values of industrial countries were virtually unchanged (they fell very slightly from 1980 to 1985, the index being at 87.1 in 1985 against 100 in 1980).

preventing old policies of control from continuing.

In the first place, choosing the correct amount by which to devalue was impossible in economies with very severe controls on imports in particular, and on the purchase of foreign exchange in general. The black maket rate was an indicator; but it was both very volatile,[9] and thought to be above a free market equilibrium level, because of the scarcity created by the allocation of some foreign exchange at the official rate.[10] Calculations of production costs or living costs relative to those in other countries might have given an exchange rate at which the current account could be balanced. But frustrated demand for foreign exchange, built up during a period of controls, would make necessary a higher domestic cost for foreign exchange than purchasing power parity. There was no way of knowing how much higher; and if an initial devaluation were not large enough, then damaging speculation would quickly build up in expectation of another.

In the second place, it seems probable that the IMF (used here as shorthand for the various external agencies which made devaluation a condition of any further external credit) feared that a once-off devaluation to a new pegged rate would allow governments to continue with previous control policies. Many governments resisted devaluation for long periods and the reasons for that resistance were not expected to disappear because of one large devaluation. It was feared then that the old macroeconomic problems would reappear quite quickly, as the change in relative prices was eroded (unless inflation was immediately reduced to international levels, which was very unlikely). If this line of argument was correct, then a floating system was necessary to prevent currency overvaluation reappearing.

In other words, it appeared that the IMF did not *trust* governments to sustain a shift in policy, from severe controls and cheap official foreign exchange, to sharply reduced or zero controls and an exchange rate which would favour rural producers rather than urban consumers. It is suggested in the next section that the choice of floating rate systems as a technique for deciding exchange rates was a cause of 'failure' of the new policy package, even where floating rates may have seemed justified for the reasons given above.

3. Policy Packages — An Explanation of the Worsening Spiral (of Inflation and Devaluation)

The policy packages, of which non-marginal increases in the cost of foreign exchange were a part, normally included structural and institutional changes, such as cuts in the size and spending of the civil service, abolition or drastic scaling down of the activities of public sector agricultural marketing boards, or forcing other parastatals to eliminate their deficits and make an appropriate return on capital.

It may seem odd to describe large devaluations as 'easy', when they were delayed for so many years precisely because they were so politically difficult. But they were indeed easy compared to sacking civil servants and marketing board employees, removing the power and patronage of those who appointed them, and cutting the costs and raising the prices of other forms of parastatal.

It was predictable, therefore, that some parts of policy packages would be implemented first, and that others would be implemented after significant delays, or not at all. Even if a govenment fully intended to make structural changes in the public sector, in addition to devaluing, it is almost inconceivable that the changes could have been implemented quickly enough (although it was reported that the agricultural marketing boards were indeed abolished in Nigeria very soon after the auction was introduced[11]).

'Quickly enough' in this context would mean within a few weeks at most. Otherwise, the combination of a floating exchange rate and a continuing large budget deficit would tend to produce further devaluation and other symptoms of failure to stabilise, as suggested above. Yet rapid action to reduce public sector employment, at the same time as reduction in the real incomes of those retaining their jobs, would mean that the real costs of adjustment would be clearly apparent before the increased profitability of exporting could be expected to produce offsetting benefits.

Putting these points slightly differently, if the public and parastatal sectors could not adjust, or could not adjust rapidly, then the entire burden of change was put on the private sector. So the private sector had to run a surplus large enough to offset the continuing impact of the public sector deficit. The smaller the share of the private sector in the economy, the more difficult this could be.

4. Theory and Non-Marginal Changes

Economic theory operates mainly in the context of marginal changes. Thus it investigates what change in quantity demanded or supplied would be induced by, say, a 10 per cent price change. But if a price changes by, say, 200 per cent, the assumptions underlying the original analysis may not hold. What are those assumptions?

[9] Parallel (black market) rates of exchange were so volatile in sub-Saharan Africa as to be useless as a price signal [Pinto and van Wijnbergen 1986:38].

[10] The same point is made in Quirk *et al.* [1987:4].

[11] Personal communication from Dr O. J. Nnanna at conference 'Auctioning of foreign exchange', Lusaka, 1987.

For a marginal price change it is reasonable (as a first approximation) to assume that the producer is able to increase or decrease production by a comparable percentage, without a major structural change. That is, the producer's response does not involve a tripling of capacity, or the dismissal of two thirds of the workforce. On the demand side, an elastic response to a 10 per cent price change does not require consumers to suddenly change their whole pattern of consumption, for example by doubling or halving the proportion of income spent on a particular commodity (or category of commodities such as imports). For a non-marginal price change, these assumptions may not be correct. If producers of tradeables are to respond to a non-marginal increase in price with an increase in production of the same order of magnitude, they must either have very large amounts of unused capacity, or be able (and willing — see the next section) to increase capacity very quickly.

An adequate response also depends on other factors, such as markets being able to absorb increased output, banks being able to supply increased working capital, and on there being spare capacity in the transport sector to handle non-marginal increases in the flows of inputs and outputs. Moreover, banks, transport operators and other providers of services to the tradeable goods sector must be able to change the structure of the services they provide. For example, it is not enough for the railways or road transport industry to have spare capacity in the form of coal trucks, if the new relative prices have created a demand for refrigerated trucks for the export of chilled beef. To give another example, banks may be slow, or refuse entirely, to switch their lending from urban importers to farmers; and even if such a structural change in lending were possible, it would take time and so create further delay in producer response to changed prices. The problem is compounded at the macroeconomic level. Whereas one producer, or even one sector might be able to increase output non-marginally, not all producers can as they would be making demands on the same limited resources (transport, credit, skilled labour).

The countries which faced this situation had, almost by definition, run-down economies. The capital stock had been poorly maintained over a period of years, having been inadequate in the first place. So a more realistic starting assumption might rather be that the supply response would *not* be of the same order of magnitude as a non-marginal change in price, or that it would be long delayed.

All these points suggest increased delay in the response to price changes, even in cases where a large enough response might really be possible in the long run. Lengthy delay would tend to put political strains on governments' ability to sustain the change in macroeconomic policy. Devaluation reduces income immediately; if increases in income in the tradeable goods sector are delayed, then there must be a period during which there are no benefits to offset the costs. This problem is worsened if delay is increased by the lack of political credibility, discussed below.

5. Political Credibility

In order for producers to respond to a price increase, they must believe that the new set of relative prices will last long enough for the investment of capital, even if only of working capital, to be rewarded. If the political leadership does not throw its weight behind the new policies, including the new set of relative prices, then producers may fear that the old regime will be re-established. Such fears would make it wholly rational to delay responding to the new relative prices. It would also be rational for people to build up stocks of imported goods and of foreign exchange, thus putting further downward pressure on a market-determined rate of exchange.

Thus in Zambia, for example, news summaries for the period when foreign exchange was auctioned show a large number of speeches by political leaders attacking the exchange rate established by auction after October 1985, and very few claiming any success from it. Other political signals gave the same message.[12] In such circumstances, one would predict that only those able to increase production instantly would increase exports; those needing to borrow and enter into a lengthy production process would hesitate. The longer the time needed, and the greater the commitment of finance, to realise the benefits of investment, the greater would be the unwillingness of producers to respond.

Although evidence is scanty, there were reports of coal and sugar exports from Zambia to neighbouring countries. The parastatal coal and sugar industries had spare capacity as a result of falling demand; the railways also had the capacity to handle the new exports because, as a parastatal, Zambia Railways had received a World Bank loan two years earlier. Less privileged corporations might have been unable to provide the necessary service because of the rundown state of much of the capital stock [UNDP 1986:113-22]. Evidence from other sectors in Zambia is scarce. But it would seem likely that new export markets would take longer to be developed than increased supply to old ones, that the export of products not previously exported would take longer still, and that the export of products not previously produced even

[12] A few months after the auction began, the Minister of Finance and the Governor of the Bank of Zambia, who were associated with reaching agreement with the IMF, were replaced. It was argued that attempts by the Bank of Zambia thereafter to lower the cost of foreign exchange, by manipulating the supply of dollars to the auction, caused an unstable rate and the eventual failure of the auction [Sanderson 1987:14-16].

for the domestic market would be delayed longest of all. It would also seem likely that homogeneous primary products, such as coal and sugar, would be easier to export soon after a devaluation than manufactured goods, which would have to be sold on other criteria as well as price.

The contrast with Nigeria was very marked. After a lengthy public debate, the Nigerian government rejected a conditional loan from the IMF, but then introduced a package of measures of its own, more severe than those proposed by the IMF, backed by a 'public enlightenment campaign' [Nnanna 1987:8]. Although it was too early for statistics to be available, strong indications of a positive supply response were reported.

6. Real and Phoney Devaluation

In some countries, smuggling across international borders was possible and occurred for a significant proportion of foreign trade, for example in Sierra Leone [see Longhurst's article in this issue] and Ghana. In those circumstances, the overvaluation of the official rate of exchange was very much less relevant than in countries where smuggling was less possible. For example, there were no reports that copper was smuggled out of Zambia. Since copper amounted to over 90 per cent of exports from Zambia, the importance of the parallel market in foreign exchange was likely to have been minor. However, even in Zambia there was smuggling of illegally mined emeralds. As always with smuggling, the extent was not recorded in official statistics nor easily available from other sources; so it was difficult to evaluate its importance.

In the extreme case, such as, at times, Uganda, smuggling was clearly more important than legal exports and imports. In those circumstances, devaluation of the official rate of exchange may have made little or no difference to most transactions. It was merely a recognition of reality, rather than a major change in relative prices. Indeed, prices in Uganda rose by only 15 per cent during 12 months when the official cost of foreign exchange rose by 148 per cent (from the first quarter of 1983 to the first quarter of 1984). Presumably some downward pressure on prices occurred from reducing the cost of illegality, and from more people being willing to sell their foreign exchange receipts (rather than hold onto them against possible future need).

More generally, the greater the proportion of foreign exchange transactions taking place in parallel markets before an official freeing of the market in foreign exchange, the less the impact of official devaluation. The main effects of official devaluation would then be:

— to eliminate the cost for producers and consumers of having to buy and sell foreign exchange illegally;

— to eliminate the cost to governments of trying to prevent illegal transactions;

— to eliminate the power and income of those few people still able to obtain foreign exchange at the official price;

— to increase incentives for those few exporters still forced to sell foreign exchange at the official price;

— and, possibly, to improve tax revenues by shifting parallel market transactions into legal channels.

One would expect, therefore, that countries where high proportions of foreign exchange transactions were taking place on parallel markets would not face non-marginal changes in relative prices to the same degree, after a large official devaluation and float. On the contrary, most producers of tradeables would face a marginal reduction in costs. And the economy as a whole would benefit from removal of the burden of giving a high income to the few who were able to buy foreign exchange at the official price.

This line of argument might be an explanation of the relative 'success' of Ghana — reducing inflation, increasing exports and reducing the budget deficit — after a 982 per cent increase in the official cost of foreign exchange [see Tables 2 to 4 above]. However, smuggling was also very widespread in Sierra Leone,[13] where inflation, exports and the budget deficit did not improve after the large official devaluation in 1983. So widespread use of parallel foreign exchange markets are by no means *sufficient* to guarantee successful adjustment. It might be quite wrong, even dangerous therefore, to use the apparent success of Ghana as a rationale for imposing a similar package on countries where most exports were being sold at the official rate of exchange prior to devaluation.

7. Income Distribution

The above discussion is concerned only with devaluation, and its impact on a small number of macroeconomic variables. If those were the only changes taking place, then it could be argued that they ought to improve income distribution.

First, in the pre-devaluation case, tight controls on the allocation of cheap foreign exchange (or valuable import licences, or cheap credit) tend to favour the better off, who are best equipped to gain access to cheap scarce resources. Moreover, such goods as do reach the market are most likely to be available in towns than in remote rural areas; and in the public sector it is the remote rural clinics and schools that first run short of drugs and books in conditions of

[13] Alluvial diamonds 'mined' by small-scale operators must be one of the most easily smuggled of all commodities; and smugglers in Sierra Leone had the added advantage of a neighbouring country (Liberia) whose currency was the US dollar.

scarcity. Meanwhile, the maintenance of government employment, at the expense of all other types of government spending, favours those in jobs rather than their clients.

Secondly, the impact on income distribution of a shift in relative prices in favour of those producing tradeables, depends on the distribution of assets, particularly land, but also access to inputs and markets. Thus if the main beneficiaries are smallholders, and the main losers are urban consumers and producers of highly protected manufactures, then the impact of a devaluation on income distribution ought to be beneficial. Even if the main beneficiaries of devaluation are larger scale producers, devaluation could increase the demand for unskilled labour, which should improve income distribution. Equally, however, it could go the other way, with large farmers and capital intensive producers gaining most, and little remaining for the poor.

But that is not the main reason for accusations that IMF conditionality worsens income distribution. Policy changes usually also include the removal of subsidies on food (and other widely consumed items), liberalisation of imports which throws some people out of jobs, and reductions in government and parastatal employment. Such changes undoubtedly cause hardship; but whether they make income distribution worse overall is not so immediately obvious.[14]

What is clear is that if the relative change in prices does not feed through to producers, or if the latter are not able or willing to respond (for whatever reason), then there would tend to be no gains to set against the immediate losses. Even if producers of tradeables are able to respond, but, as seems likely, only after a delay, then there are immediate losses with no immediate offsetting gains. That creates a political as well as an income distribution problem.

Thus, if non-marginal devaluation does have the intended effect on output, the overall effect on income distribution must depend on the structure of output, and the effect on the demand for labour. All would depend on the particular structure of each economy.

8. Conclusions and Hypotheses for Research

The above arguments suggest some conditions for successful adjustment following non-marginal increases in the official cost of foreign exchange. One would predict (relative) success at the macroeconomic level to the extent that:

— the change in relative prices is passed through to producers of tradeables;

— producers of tradeables have the capacity to increase production at once by non-marginal percentages, of the same order of magnitude as the real devaluation;

— inputs and services are available, in the right form, to enable the increase in tradeable output and exports to occur (for example credit, transport, marketing, etc.);

— the change in relative prices is expected to last, which depends in turn in the policy change having been 'internalised' (proposed or adopted as their own and therefore publicly supported by political leaders);

— the private sector is relatively large, and or the public sector does not need to be reduced non-marginally, and or parastatal institutions do not require non-marginal structural change;

— it proves possible to reduce the public sector deficit (since otherwise floating the exchange rate will induce accelerating depreciation) either by cutting government spending or because the net impact on tax revenue is favourable.

One would predict a favourable effect on income distribution to the extent that the above conditions held, and if in addition tradeable goods were produced mainly by smallholders or by labour intensive processes.

Two points stand out with respect to recent SSA experience: first, that all of the above conditions were unlikely to hold in any one case, so that a high degree of success could be expected to be rare; and second, that the likelihood of success would depend on the conditions and structure of particular economies, as well as on the way the policy package was adopted and implemented in each case. A counterfactual question should also be raised. Even where the degree of success was very low, it would be right to ask whether a country was better off with a destabilised exchange rate, than with a continuation of controls and severe overvaluation. Even if only a minority of exporters could respond, it could be argued that that was better than no change at all. For the future, it should be possible to identify factors that have affected the probability of success in countries where non-marginal devaluation and exchange rate floating have already been tried. In turn, that might improve the chances of success if similar experiments are chosen by or forced on other African economies.

[14] The losers are more likely to be heard, because they are mainly urban.

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