

IMF Working Paper

© 1997 International Monetary Fund

This is a *Working Paper* and the author(s) would welcome any comments on the present text. Citations should refer to a *Working Paper of the International Monetary Fund*. The views expressed are those of the author(s) and do not necessarily represent those of the Fund.

WP/97/64

INTERNATIONAL MONETARY FUND

Research Department

Contrasting Monetary Regimes in Africa

Prepared by Patrick Honohan and Stephen A. O'Connell 1/

Authorized for distribution by David Folkerts-Landau

May 1997

Abstract

In post-independence sub-Saharan Africa, institutional arrangements for monetary policy have taken a variety of forms, although the historical evolution of many African financial systems has been similar. This paper identifies five different regimes and examines how they evolved over time. It focuses on how the alternative institutional arrangements have influenced the performance of monetary policy under fiscal pressure, and concludes that, although the trend appears to be toward more flexible regimes, the transition to greater flexibility can exacerbate problems of credibility and of macroeconomic management.

JEL Classification Numbers: E42, E50

Keywords: Africa, Monetary Policy, Central Banks

Author's E-Mail Address: phonohan@esri.ie

1/ The authors were visiting scholars in the Research Department. Patrick Honohan is at the Economic and Social Research Institute, Dublin; Stephen A. O'Connell is at Swarthmore College. We are indebted to many economists at the IMF, especially P. Acquah, R. Basanti, C. Brachet, D. Cowen, R. Hicks, G.G. Johnson, X. Maret, D. Marston, S. Rothman, E. Sacerdoti, V. Santiprabhob, M. Ucer, and R. van Til, for helpful discussion on particular countries. Very helpful comments and suggestions were received from P.-R. Agénor, I. Elbadawi, L. Harris, M. Khan, T. Killick, C. Kimei, M. Ncube, B. Ndulu and S. Sharma.

Contents	Page
Summary	4
Introduction	5
I. The Monetary Policy Problem	5
A. Introduction: Perceptions of the Role of Central Banking in Africa—at Independence and Now	5
B. Evolution of Monetary Policy Regimes in Africa	7
II. Functioning of the Economy under the Different Regimes	12
A. The Automatic Regimes	12
Regime I: rules-based systems	12
Regime II: the "printing press"	13
B. The Non-Market-Clearing Regimes	14
Regime III: the controlled economy	14
Regime IV: credit ceiling	15
C. Discretion Subject to Market-Clearing	15
Regime V: pure market-clearing	15
III. Monetary Impact of Government Finance	16
A. Fiscal and Monetary Authorities; Different Powers, Different Goals	16
B. Monetary Reactions to Fiscal Pressure Under the Different Regimes	20
Regime I: rules-based system (cf. the Franc Zone and Botswana)	20
Regime II: the printing press (cf. Zaire)	21
Regime III: the controlled economy (cf. Ghana and Tanzania in the 1970s)	21
Regime IV: the credit ceiling regime (cf. Nigeria, Zimbabwe)	22
Regime V: the market-clearing regime (cf. Kenya)	22
IV. Impact on Growth and Volatility	23
A. Stylized Monetary Facts for Africa	23
B. Monetary Pressures and Economic Performance in the Long-Run	29
C. Transmission of Volatility in Different Regimes	31
V. Achieving Successful Transitions	36
A. The 1994 Devaluation of the CFA Franc	36
B. Convincing the Market of a Regime Change: Tanzania, Ghana, Kenya	38
VI. Conclusions	40
Tables	
1. Historical Evolution of Monetary Policy Regimes	9
2. Historical Evolution of Monetary Policy in Africa	11

Figures

1.	Central Bank Independence and Inflation. Selected African Countries	19
2.	Quantity Theory of Money in Africa	24
3.	Money and Inflation in African Countries	25
4.	Money and Investment in African Countries	27
5.	Growth and Government Credit Share	28
6.	Growth and Inflation. Experience of different regimes	30
7.	Inflation and Government Credit	32
8.	Inflation: Level and Variability	34
9.	Inflation Variability and Growth	35
10.	Combinations of Inflation and Crowding Out for Deficit Financing (d) and Capacity Growth (y)	37
Appendix I Some Algebra of Crowding-out and Inflation		42
Bibliography		46

SUMMARY

In post-independent sub-Saharan Africa, institutional arrangements for monetary policy have taken a variety of forms, and countries have experienced diverse outcomes in terms of average macroeconomic performance and volatility. Despite the variety of regimes, however, the historical evolution of many African financial systems has followed a similar pattern—passing from relatively open fixed exchange rate regimes under colonialism, through an era of greater economic regulation and control of banks, to a less regulated, more open financial system.

This paper identifies five different regimes—rules-based systems like the currency board; automatic monetary financing; controlled economies, with severe rationing of goods and foreign exchange; regimes in which monetary policy operates through credit ceilings; and fully market-clearing discretionary regimes.

The paper focuses on how alternative institutional arrangements have influenced the performance of monetary policy under fiscal pressure, including the trend and volatility of inflation and the degree of credit rationing to the productive sector, and examines how the regimes evolved over time. It finds that some of these regimes are clearly inferior while the merits of the others remain disputed. It concludes that, although the trend of the future seems to be toward the more flexible regimes, the transition to greater flexibility can exacerbate problems of credibility and of macroeconomic management generally.

INTRODUCTION

The post-independence history of sub-Saharan Africa displays both a wide variety of institutional arrangements for monetary policy and considerable diversity of policy outcomes in terms of average macroeconomic performance and volatility. Some countries have managed to retain a degree of price stability and a financial market relatively undistorted by administrative or quasi-fiscal controls. Others have seen extremely high and volatile inflation alongside heavily rationed credit. Although some of these differences may be attributable to contrasting experience with internal and external macroeconomic shocks, much is also due to choice of monetary institutions and policy structures.

Despite the cross-sectional diversity which is observed in African monetary arrangements and which we will explore in some detail, there have been common trends in the historical evolution of many African financial systems. From their roots in relatively open colonial fixed exchange rate regimes, most countries passed through an era of greater economic regulation and control of banks, often behind protective tariff and exchange control barriers, and in many cases suffering extreme bouts of inflation, before emerging into a less regulated and open, "reformed" financial system. A central problem of monetary management and a driving force behind this evolution has been heavy reliance on the domestic financial sector for the financing of fiscal deficits. Our subject here is how alternative institutional arrangements have influenced the performance of monetary policy under fiscal pressure, and on how the regimes themselves have evolved over time.

The paper is organized as follows. In Section I, we introduce the monetary policy problem in an African context and describe the regimes into which African monetary experience has fallen. Section II considers the functioning of the economy under each of the regimes, while Section III focuses on the transmission of fiscal shocks under alternative regimes. Section IV discusses the way in which different monetary regimes may have impacted on growth and volatility, while Section V addresses the problem of achieving successful regime transitions. We conclude the paper in Section VI. An Appendix illustrates the steady-state algebra of the choice between crowding-out and inflation as alternative ways of financing an intractable deficit.

I. THE MONETARY POLICY PROBLEM

A. Introduction: Perceptions of the Role of Central Banking in Africa—at Independence and Now

When African states introduced their own currencies and central banks at, or shortly after, independence, it was in a very different intellectual environment to that which prevails today. A national money was viewed not only as an important symbol of sovereignty, but also as a multi-purpose tool of national development. Independence naturally led to a number of institutional innovations designed to ensure that the monetary and financial system was geared to assisting in the achievement of these new goals. African financial systems thus evolved very

differently from those of the colonial powers on which they had originally been modeled.¹ Monetary policy was to be the servant of national development, and an active policy towards this end was adopted in most countries.

But this experiment went badly wrong, partly because of pressures external to the financial system, partly because, as we understand central banking today, it was being asked to do too much. In many countries, monetary policy institutions ceased to perform the functions that had been envisaged for them. Interestingly, the institutional evolution was by no means the same in all countries. Instead, at least five contrasting monetary policy regimes need to be distinguished if we are to make sense of post-independence African monetary history. Each coped in a very different way with external pressures, pressures which typically had their origin in, or at least made themselves felt through, fiscal deficits.

Nowadays, most African scholars and policymakers increasingly subscribe to a conventional view of central banking. That view prioritizes the objectives of monetary policy much more strongly than did either theoretical orthodoxy or the African central banks themselves in the 1960s and 70s. The time consistency literature, in particular, argues that central banks that fail to specialize in monetary stability—making low inflation a clearly overriding priority as against output stabilization, fiscal support to government, or a competitive real exchange rate—end up with excessive inflation and with no offsetting gains in economic performance (see Cukierman, 1992 for an analytical survey). Independent central banks, statutorily charged either primarily or exclusively with the goal of price stability, have become the norm in theory and proposal if not yet often in practice. There is little room here for an active development role; rather, long-run growth is promoted through the maintenance of low inflation, which increases investment and growth by reducing macroeconomic uncertainty.

The modern view also recognizes that, in order to achieve price stability on a sustainable basis, however, the monetary authority may require some flexibility with respect to the evolving economic and political environment. Rigid or automatic policy rules may destabilize prices, for example, in the face of shifts in key behavioral relationships like the demand for money. Market expectations may be influenced in unintended ways by policy actions. If the pursuit of price stability is so single-minded as to induce recession, the political consensus within which the monetary authorities operate may be fractured. Finally, the smooth functioning of the monetary system may itself be a necessary concomitant of price stability. If the liquidity of monetary assets is compromised by bank insolvency, or if the volatility of interest rates strongly discourages the emergence or survival of efficient financial markets, then indirectly the objective of price stability has been impaired.

¹Though there are still echoes of the characteristic distinctions between European monetary institutions of the 1950s in African banking systems of today. This can be seen not only in the legal structures, but in such institutions as the *centrales des risques*, formal information sharing systems for banks universal in francophone countries, but almost unknown elsewhere in Africa.

The monetary policy problem may thus be seen as one of achieving long-term price stability while mitigating the effects of macroeconomic shocks on the banking system and economic activity. African experience suggests that restraining the public sector's demand for monetary finance is the essential requirement for long-run price stability. Shock absorption is a more complicated issue. A successful shock absorber will attempt to ensure not only that exogenous shocks have little effect on aggregate price levels, but also that they do not have avoidable effects on real aggregates. The volatility of market expectations considerably complicates achievement of the latter function, as policy responses to shocks may be misinterpreted by the markets as representing a shift in the government's commitment to long-run price stability. Two standard remedies are (1) to design policy rules that enhance stability without requiring discretionary intervention; (2) to develop the central bank's expertise and reputation, so that private sector expectations are robust to discretionary interventions.

The modern discussion is thus summarized by the key dimensions of price stability and independence of the central bank, and by the continuing debate between rules and discretion. But analysis along these dimensions alone cannot do full justice to African monetary history.

B. Evolution of Monetary Policy Regimes in Africa

While most African countries inherited a rules-based, fixed exchange rate regime at independence, the institutional changes that they adopted for development purposes had the result that, as the years went by, the monetary regimes of different countries evolved very differently from one another (cf. Duesenberry and McPherson, 1992).

In many cases, the starting point was a formal currency board. The British multi-country currency boards in West and East Africa were already under some pressure from nationalist aspirations to central banking expressed in the 1950s.² This, combined with the common perception that full sovereignty required having one's own currency, meant that, following independence, the days of these currency boards were numbered. In contrast, the greater degree of post-independence involvement by France in the monetary arrangements of the CFA zone, exemplified by the overdraft facility which was kept open, helped ensure that only a few of the CFA countries broke away - notably Guinea.

But if they were to abandon the currency board, what alternative was available? Three sharply different routes were chosen by different countries. One route, preferred on ideological grounds by socialist-minded governments, was an economy of rationing and controls. Another possibility, though not one consciously advocated by anyone, was to give up any attempt to restrain inflation, and to allow the printing press free rein. The third route

²In central Africa, the Federation had its own central bank as early as 1956, but in practice policy changed very little at first. The 1950s Colonial administration in the Gold Coast offered only a feeble intellectual opposition to the proposal for a central bank. Among their chief arguments was the lack of a suitable building (Sowa, 1996).

was to follow the contemporary European trend of increasingly discretionary central banking, retaining administrative credit ceilings, but in an otherwise market-oriented economy. (A final option, embracing a more thorough-going market-clearing financial system was not on the cards until the late 1980s).

These, then, are the five regimes which need to be considered if we are to capture the range of post-independence historical experience in Africa. Reorganizing them schematically, we begin with two regimes that lack discretion—the "automatic" regimes. These are (I) rules-based systems like the currency board, and (II) automatic monetary financing, or what we will call "the printing press". Then there are two discretionary regimes characterized by the degree to which intervention limits market-clearing. These are (III) the controlled economy, in which there is relatively severe rationing of both goods and foreign exchange, and (IV) regimes in which monetary policy operates through credit ceilings (but are otherwise market-driven). Finally we include as (V) the fully market-clearing discretionary regime which characterizes the most sophisticated financial sectors today.

Any attempt to rationalize the evolution of regimes for each country as if the government had consciously adopted institutional arrangements that were optimal for its circumstances would be unconvincing. The forces of change were varied. Sometimes regime changes have been deliberate and pre-announced, sometimes an unforeseen and unsought response to external pressures.

Even where the change has been deliberate, there have been many different types of influence on the decision. Sometimes a change in political ideology has been a determining factor (notably in the early espousal of controls and rationing by some early post-colonial governments). Sometimes prevailing economic doctrines have changed even without a political re-orientation (this has clearly been a factor in the recent widespread return towards reliance on the market). Even without a change in attitude or analysis, awareness of changing external circumstances can induce policymakers to prefer a different regime. For example, global technological changes have reduced the effectiveness of administrative financial controls thereby undermining the viability of regimes that depend on such controls. The influence of the IMF has also important in achieving regime change when a country's credit-worthiness and borrowing needs have reached the point where its assistance became essential.

But other exogenous pressures have also resulted in regime change, even when no conscious policy decision was involved. Above all, the magnitude of fiscal pressures have pushed several countries into a new monetary regime.

Of course the boundaries between regimes are not altogether clearcut, and there is room for some dispute in classifying the historical experience. Table 1 offers a tentative summary classification for African countries of which regime mainly prevailed in each of the

Table 1. Historical Evolution of Monetary Policy Regimes

(Tentative classification)

	1960	1970	1980	1990
Angola		III	III →	II
Benin	I	I	I	I
Botswana	I	I	I	I
Burkina Faso	I	I	I	I
Cameroon	I	I	I	I
Central African Republic	I	I	I	I
Chad	I	I	I	I
Congo	I	I	I	I
Cote d'Ivoire	I	I	I	I
Equatorial Guinea			I	I
Ethiopia		IV	IV	IV
Gabon		I	I	I
Gambia, The	I	I →	IV	IV
Ghana	I →	III →	IV →	V
Guinea	III →	III →	II →	I
Guinea-Bissau			II	II
Kenya	I →	IV	V	V
Lesotho	I	I	I	I
Liberia	I	I →	II	II
Madagascar	I	I →	IV	IV
Malawi	I →	IV	IV	IV
Mali	IV →	I	I	I
Mozambique		III	III →	IV
Namibia			I	I
Niger	I	I	I	I
Nigeria	I →	IV	IV	IV
Rwanda	I	I	I	I
Senegal	I	I	I	I
Sierra Leone	I	I →	II	II
Somalia	I →	IV →	II	II
Sudan	I →	III →	IV	IV
Swaziland		I	I	I
Tanzania	I →	III →	IV	IV
Togo		I	I	I
Uganda	I →	III →	II →	IV
Zaire		II	II →	II
Zambia	I →	IV →	II	II
Zimbabwe	I →	IV	IV →	V

post-independence decades. It is worth looking a little closer at how the evolution has occurred in different countries.

Thus, both political orientation and the coherence of macroeconomic policy determined which of regimes II, III and IV succeeded the currency board experience. Those countries following a more-or-less socialist model, such as Angola, Ghana, Guinea, Mozambique and Tanzania, moved to the rationing regime with an attempt to control prices, exchange rates, or both, at the cost of disequilibrium and the emergence of parallel markets. Where socialist ideology was not as strong, the preferred regime was the credit rationing one, which (after all) was then in general use in the industrial world. Even though they experienced elements of goods and foreign exchange rationing, Kenya, Malawi and Nigeria could represent early examples of its adoption. All African countries suffered fiscal pressures, but in some the government proved unable to manage the pressure in an orderly way - often due to civil war - and these fell into the printing press regime (II), not as a deliberate choice, but as a reflection of generalized failure of governance under pressure. The printing press regime often followed a period of goods rationing (III), but in some cases represented the collapse of a credit ceiling (IV) regime. In the case of Liberia, the transition from currency board to printing press was fairly direct.

If political ideology or *force majeure* dictated most of the early transitions, recent transitions have been typically based on a deliberate response to economic arguments in favor of more market-oriented solutions. The force of economic logic has propelled Tanzania and Ghana, for example, away from the rationing of goods and in the direction of regimes IV and V. Where the economy had slipped into the printing press regime, the recovery to a better regime also reflected the reconstruction of civil society, or at least the strengthening of national governance on a wider basis than the purely monetary. This is how we interpret the recent developments in Uganda and Guinea, for example. Note that not all of recent transitions are towards IV or V. Some, like Guinea, have moved back to more of a rules-based system. Likewise, the recent devaluation of the CFA can be interpreted as a renewal of commitment to that rules-based system which had, in the early 1990s, become increasingly threatened by elements of rationing.

Despite the variety, then, a dominant pattern of regime evolution emerges. The desire for flexibility moved many away from the currency board, sometimes to the rationed regime. If this got out of control the printing press awaited. Dissatisfaction with the distortions of the rationed regime or the disruption of high and variable inflation, has pointed towards the world of discretionary central banking, usually through the half-way house of credit ceilings and interest rate controls. Greatly oversimplifying, if we arrange the regimes in a tabular form as shown in Table 2, the typical evolution under fiscal pressures thus emerges as a clockwise route starting at the top left. Eventually, a country that has arrived at the unsatisfactory bottom right will adopt a sweeping reform, either back to a rules-based system (bottom left) or into the centre: discretionary central banking in a market-clearing environment. Fiscal pressures make the centre difficult to achieve; fiscal consolidation makes it more tenable.

Table 2. Historical Evolution of Monetary Policy Regimes in Africa

	Does not finance Government		Chiefly finances Government
Fixed exchange rate	I Currency Board Rule	→	III Rationed Regime
		IV, V Discretionary Central Banking	↓
		↖	
Flexible exchange rate	I Cash Budget Rule	←	II Printing Press

Today, rationing of goods or credit is employed less-and-less. The printing press remains in several countries, but not out of choice. The trend, under the pressures mentioned above, or more generally because of dissatisfaction with regime performance, has been towards more flexible policy regimes, with an important minority preference for a return to, or consolidation of, rules-based systems. The relative merits of rules-based and discretionary systems remain, indeed, the most disputed area in African monetary policy today.

Apart from monetary policy *per se*, many of the other development-oriented financial initiatives of the early post-independence period were only partly successful, and some have begun to be reversed. Full or partial nationalization of commercial banks, for example, was an important part of the localization effort. But foreign-based and trading companies remained heavily represented in the customer base of the banks, reflecting the continuing importance of trade finance in most African countries, and for this reason commercial banks often retained a post-colonial flavor. Directed credit policies were widely deployed in attempts to alter this reality, but these have tended either to be ineffective or, where they have succeeded in influencing credit allocation, to destabilize the finances of the banks themselves. An alternative approach, often used in tandem with directed credit policies towards commercial banks, was the establishment of government-owned development banks with the purpose of channeling (mostly foreign-sourced) funds for long-term capital investment. By the early 1980s a majority of these had run into severe financial difficulties.

II. FUNCTIONING OF THE ECONOMY UNDER THE DIFFERENT REGIMES

In this section, we describe how the economy functioned under the different regimes, and how they were related to characteristic features of African economies over the years.

A. The Automatic Regimes

Regime I: rules-based systems

Though no African country now follows the pure currency board system, it is useful to describe this system as the archetype of rules-based system. As introduced in colonial times, currency boards had the purpose of economizing on the use of the currency of the colonial power, thereby allowing the seigniorage to accrue to the local administration. The powers of a pure currency board are limited to issuing local notes in exchange for claims on the colonial government. (The net profits arising mainly from investment income are then remitted to the local - originally the colonial - administration). Other standard functions of a central bank are explicitly precluded, including lending to or accepting deposits from the government or the banks, prudentially supervising the banks, setting credit ceilings or interest rates, imposing exchange controls, or varying the nominal exchange rate.

A pure currency board can therefore be viewed as a set of rules preventing the exercise of discretion in most dimensions of central bank activity. These restrictions produce a system with considerable resistance to policy errors. Such arrangements are not unknown in independent countries, although they have not survived for long except when the country is economically linked to a single large trading partner (as in the case of Panama). Currency boards are naturally thought to be particularly appropriate when the institutional and political structure is not conducive to the prudent exercise of discretion.³ They may act as agencies of restraint in the sense discussed by Collier (1991).

Despite the ability of the currency board to avoid the policy traps of more complex regimes, its lack of flexibility makes it impotent in the face of exogenous shocks. For example, it has no role in financing a payments deficit: the deficit will drain the economy of liquidity, prompting an increase in domestic interest rates and placing downward pressure on domestic prices, wages, and economic activity and potentially threatening the solvency of banks. The currency board is also not at liberty to extend "lender of last resort" facilities in a banking

³The success of the currency-board-like arrangement implemented in Argentina in 1992—with a fixed exchange rate and full backing of the monetary base by international reserves illustrates this argument. Following the break-up of the Soviet system, currency boards were advocated not only for the peripheral members of the Rouble zone (and successful exemplars have been operating in Estonia and Latvia) but also for Russia itself (Hanke and Schuler, 1994).

crisis. This lack of discretion is the price that has to be paid for insulating the currency from short-term political pressures.⁴

In Africa, Liberia went further than the currency board, using U.S. dollar bills rather than local currency notes; this system was eventually subverted by the decision to finance government deficits with token coin. Elsewhere in Africa, the currency-board-type arrangements left behind by colonial administrations were fairly quickly abandoned in favor of more flexible systems. The two smallest rand zone countries (Lesotho and Swaziland) have retained currency-board-like characteristics to the present, including a peg to the rand and tight limitations on monetary finance of government. Botswana left the rand zone in 1974, and while its exchange rate policy is formulated with close attention to the rand, its central bank now exercises discretion in most dimensions of monetary policy.

The rules governing monetary policy in the CFA franc zone have also been likened to those of a currency board, although the analogy has always been imperfect. The two central banks lend to government, although statutory limitations have restricted their ability to do so. They have also made large loans to the commercial banks (who themselves lent substantially to parastatal firms) and have regulated bank credit. Their ability to lend to the banking system is greatly enhanced by the lack of a requirement to back the currency with holdings of foreign exchange. Instead of substantial foreign exchange holdings, the CFA central banks have had access to an overdraft facility at the French Treasury. Despite all these deviations from the pure currency board model, the institutional structures of the CFA central banks, especially their multi-country constitution and special links with France, meant that the CFA franc held its peg to the French franc unchanged for almost half a century before the large devaluation of January 1994.

Although the fixed exchange rate is the most obvious feature of the textbook currency board, the prohibition on lending to government is arguably more important. The "cash budgets" introduced recently in a number of African countries under IMF programs (e.g., Tanzania, Uganda, and Zambia) borrow the latter feature: by restricting current government spending to current revenue, they prohibit central bank financing of the government on the margin. As with fixed exchange rates, of course, cash budgets can coexist with arrangements that allow substantial discretion on other dimensions of monetary policy.

Regime II: the "printing press"

At the opposite end of the spectrum of automatic systems is what we term (somewhat facetiously) the printing press. This is an institutional arrangement that has the effect of meeting any shocks, fiscal or external, with a passive monetary accommodation. We reserve this term for regimes that do not also rely on heavy rationing in the foreign exchange market and domestic goods markets, or in which such interventions as exist are highly ineffective.

⁴Here again the example of Argentina, where capital outflows precipitated in part by Mexico's peso crisis generated a highly contractionary response, is instructive.

Lacking any nominal anchor, this system is characterized by a virtually automatic response of prices and the exchange rate to macroeconomic shocks. The fiscal gap is closed through the inflation tax, and the average ability of the printing press to meet these needs is limited by the inverse relationship between money demand and the expected rate of inflation.⁵

Shocks that produce "inflation surprises" can increase the financing delivered by a printing press substantially in the short run, but the ability to do so over time is limited by relatively rapid adaptation of inflation expectations. These systems are potentially unstable, since the fiscal deficit tends to worsen and substitution into inflation hedges (domestic real assets and foreign currency) to become more sensitive at high rates of inflation (see Bruno and Fischer, 1990). Although a number of African countries have exhibited this kind of behavior during some part of their history, the best example is Zaire, whose reliance on monetary financing of the government budget deficit has been heavy and sustained, despite hyper- or near hyper-inflation.⁶

B. The Non-Market-Clearing Regimes

Regime III: the controlled economy

In controlled economies, the authorities refuse to allow prices or quantities to adjust in order to clear markets. Consequently, there is rationing of goods and foreign exchange. Shocks are expressed in changes in the severity of rationing. Extensive price and foreign exchange controls were an important feature of macroeconomic policy in many African countries between the late 1960s and the mid-1980s, and the behavior of economies under this kind of regime is sufficiently different to warrant separate treatment.

There have recently been contrasting theoretical analyses of rationed economies. In one approach, which they see as relevant for African economies, Bevan et al. (1990) stress that the dynamics of these systems can become unstable when market interventions and fiscal requirements are not mutually compatible. Another approach stresses the fact that rationing generates rents, and that these in turn provide incentives for the development of parallel markets in which credit, goods and foreign exchange are traded at market-clearing prices. The behavior of economies with pervasive parallel markets approaches that of an unrationed

⁵The inflation tax is not the only way of extracting quasi-fiscal resources from the financial system, cf. Chamley and Honohan (1993), Honohan (1993).

⁶There have been months in each of the past six years in which prices rose by more than 30 per cent in Zaire. The most severe hyperinflation was when monthly inflation averaged 227 percent during November 1993 to January 1994. This was in fact the highest monthly inflation ever recorded for any country in *International Financial Statistics*. There is heavy government reliance on monetary financing - reaching as much as three-quarters of Government expenditure in one recent three-month period, with the Central Bank in no position to refuse financing requests.

economy with a set of taxes and subsidies on transactions taking place at official prices. Agénor and Haque (1995), Agénor and Montiel (1995) and Montiel, Agénor and Haque (1993) provide thorough theoretical analyses of economies with widespread informal markets, and we will not develop this aspect further here.

The controls that induce severe rationing of goods or foreign exchange have been dismantled in many countries over the past decade or so. Countries such as Ghana, Guinea, and Tanzania are no longer chiefly characterized by this kind of regime, as they would have been as late as the early 1980s. Even Angola's distortions are no longer as severe as they were as late as 1992 (cf. Pereira da Silva and Solimano, 1994).

Regime IV: credit ceiling

An empirically important deviation from the pure market-clearing approach is the case in which commercial banks face ceilings on credit expansion. Such arrangements have been a common feature of stabilization programs agreed with the IMF. Credit ceilings, which are typically but not always associated with interest rate controls, may induce macroeconomic responses to shocks that are quite different from those that emerge when credit is market-determined. This category covered a growing number of African countries by the 1980s (cf. Decaluwé and Nsengiyuma, 1994, Mweha and Killick, 1990).

C. Discretion Subject to Market-Clearing

Regime V: pure market-clearing

From one point of view, the purely market-oriented central bank (regime V) provides a kind of middle course between regimes I and II. It may lend to government and to the banks to meet seasonal, cyclical, or unanticipated needs, but passive monetary accommodation is not the normal response to shocks. Institutional arrangements discourage heavy government reliance on monetary expansion, and the monetary authorities will typically balance a variety of instruments—including the nominal exchange rate, interest rates, central bank lending, foreign borrowing by government, and others—to meet the needs that present themselves.

From another perspective, this is discretion (as in regimes III and IV) but without reliance on administrative controls restricting market-clearing. The range of potential outcomes is wide, and the policy problem correspondingly complex. Although this type of regime, in which market-determined prices play a central role, is the norm in industrial countries, it is only recently that it has become of central relevance to an increasing number of African countries. It seems to represent the trend of the future, but the rules-based systems still have strong adherents.

III. MONETARY IMPACT OF GOVERNMENT FINANCE

Industrial countries have experienced a dramatic transition in recent years to the point where the monetary system is no longer treated as a significant source of revenue for financing the budget. More and more central banks have been granted statutory independence of the fiscal authority. (For example, EU member states now prohibit most direct or indirect lending by central banks to governments.) It was not always thus. Relatively high rates of inflation were associated with significant seigniorage and other quasi-fiscal revenues to governments, even when budgetary pressures may not have been the driving force behind the inflation. By suppressing any significant fiscal impact on monetary affairs, policy concerning the latter can focus on providing a stable price and exchange rate environment as a platform for sound evolution of financial intermediation and, more generally, for trade and investment.

This new thinking has not been altogether ignored in Africa. However, in practice fiscal issues remain of central importance in influencing monetary developments.⁷ And in the historical record, it has been from the fiscal side that the greatest pressures have been placed on African monetary systems. Of course other external shocks, notably commodity prices and drought, have been very important (as have market confidence shocks more recently) but the main monetary impact of many of these shocks has been through the fiscal channel.

A. Fiscal and Monetary Authorities; Different Powers, Different Goals

The distinction between fiscal and monetary authorities is not always clearcut (cf. Owoye and Onafowora, 1994). In practice it is made on the basis of the instruments of policy which each exercises. The fiscal authorities set rates of tax and subsidy, and the magnitude and pattern of other forms of government expenditure.⁸ The monetary authorities are

⁷Easterly, Rodriguez and Schmidt-Hebbel (1994) contains a wide-ranging review, which includes useful case studies on Cote d'Ivoire (Chamley and Ghanem), Ghana (Islam and Wetzell) and Zimbabwe (Morales and Schmidt-Hebbel). We agree with their observation that inflation has causes additional to those coming from fiscal pressures, and that the extent to which the monetary system can finance deficits is limited. Nevertheless, it is on this channel that we are focusing in this section.

⁸Credit to public enterprises poses a tricky issue of data interpretation. For some purposes it is desirable to lump this in with government credit, especially where the public enterprises have little commercial autonomy and can best be thought of as operating arms of the government. Public enterprise borrowing may be simply government borrowing in a different guise; and indeed government may turn to borrowing from its enterprises if there is some barrier to its own borrowing, as occurred in many of the CFA countries during the 1980s. But under other circumstances the borrowing of public enterprises should be treated separately. After all, if it has relative freedom to pursue a commercial remit, a publicly-owned enterprise may be borrowing no more or less than would a privately-owned enterprise in the

(continued...)

monopoly issuers of the national currency. They deal in the markets for foreign exchange and for domestic liquid assets, and may set official prices and interest rates in such markets. They regulate the behavior of banks.

Regardless of local institutional arrangements, the fiscal authority is constrained by the budgetary identity requiring that any excess of expenditure over revenue must be met with some form of borrowing, domestic or foreign, explicit or implicit, forced or voluntary, or through recourse to the monetary authority.

The monetary authority is also constrained, but in a somewhat different way. It faces a market constraint in that the demand for currency and other liabilities of the monetary authority (such as reserves held by banks on deposit) is sensitive to the level of domestic prices and to the exchange rate, and to the degree of rationing that prevails in goods and foreign exchange market. This demand can be influenced by regulations governing banks, but only to a certain extent.

All African countries have an institutional distinction broadly corresponding to this analytical distinction in that all rely on an institutionally distinct central bank for the conduct of most of the functions of the monetary authority. But in many countries, the distinction is of comparatively minor consequence for the design of policy, in that monetary and fiscal decisions are in practice taken by a single authority, often the presidency.

Legislated or constitutional independence for the central bank is stressed in the literature, but can be of little practical importance unless the political and public opinion context is such that there are sanctions for a government which attempts to circumvent the statutory limitations. In a politically repressed environment, statutory or constitutional independence for the central bank is likely to remain a dead letter. Following global fashions, independence of the central bank begins to be introduced in Africa also, either by legislative process (Ghana, Tanzania), or as an enforced consequence of historical events (Franc zone). However, the practical reality can lag long behind legislation, particularly because the true independence of any central bank is guaranteed in practice only by the effectiveness of a well-informed public opinion.⁹ Otherwise, external restraints may substitute for it.

The empirical evidence on the effectiveness of central bank independence confirms that it would have been a mistake to expect too much from independence *per se* in Africa. For instance, in Cukierman's (1992) ranking of 70 countries by the independence of their central

⁸(...continued)
same market.

⁹The central bank can itself help to cement its emerging independence by establishing intellectual credibility. Public opinion will treat a government's dismissal of the central bank more harshly if the central bank is already respected as a knowledgeable adviser on monetary affairs.

banks, the mean rank of the ten African countries included in his list is 28: so by this reckoning the African central banks are more independent than average. However, (as for the total sample) there is no significant negative correlation between this index of independence and inflation (Figure 1).^{10, 11} This confirms our view that in the historical period, independence or not of the central bank has not been a helpful way of distinguishing the monetary arrangements of different countries.

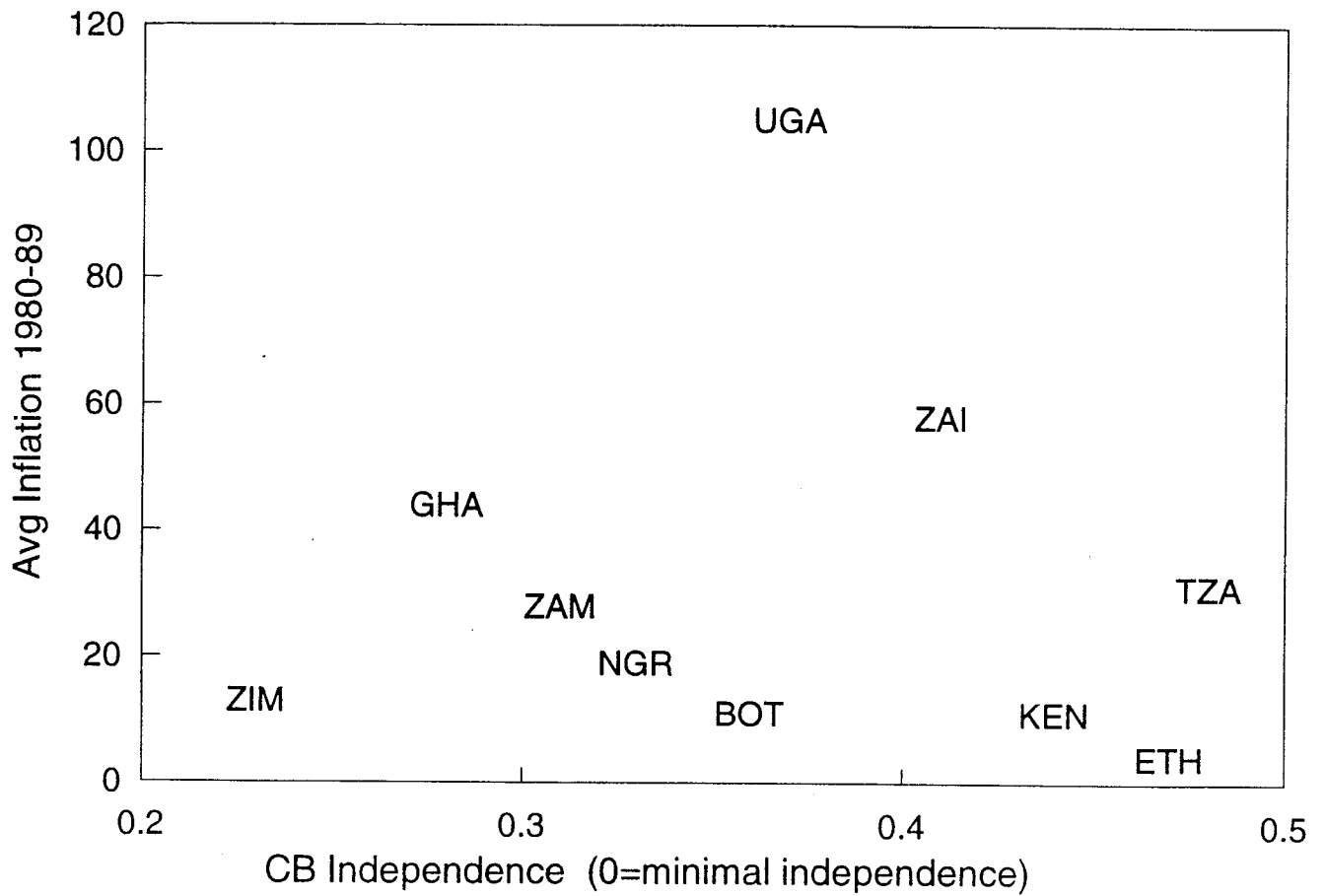
Other considerations should qualify advocacy of absolute independence of the central bank. For one thing, the experience of the CFA franc zone has shown us that excessively rigid application of simplistic monetary policy rules can lead to alternative fiscal policy solutions which damage the economy more than would a more flexible monetary policy. Besides, there have been a few large-scale financial abuses in central banks in recent years, enough to make it important to ensure that central bank independence does not go so far as to preclude needed audits.

An open political environment and a public awareness of the consequences of monetary financing also help to inhibit the fiscal authority from excessive reliance on the central bank. Such informal arrangements as the U.S. Federal Reserve-Treasury "Accord" of 1951 and the Italian "Divorce" of 1981, both of which removed responsibility from the central bank for supporting the price of government securities, can also help. Also needed are basic institutional reforms, such as prompt publication of clear central bank accounts, revealing what has been done; a requirement for a formal prior request at the level of the central bank's governing body for any monetary financing; and insistence that the central bank can only acquire government securities through the market, thereby ensuring that a market rate of interest is paid on them. Other institutional arrangements are unhelpful, such as the existence

¹⁰*International Financial Statistics* is the source for the inflation data in Figure 1, and for the data in the other Figures except Figures 3,4 and 6, which also draw on the World Bank's *Stars* database.

¹¹Cukierman et al. (1992) showed that turnover of central bank governors was more highly correlated with inflation than the overall index of legal independence. This is not true for their African subsample, for which turnover is essentially uncorrelated with inflation in both the 1970s and 1980s.

Figure 1: Central Bank Independence and Inflation
Selected African Countries



of easily revised reserve requirements or credit ceilings, which can be used to divert loanable funds to the government, albeit in a non-inflationary manner.

B. Monetary Reactions to Fiscal Pressure Under the Different Regimes

The response of the monetary system to fiscal pressures depends on what regime is in effect. Some adapt through inflation and depreciation, some through rationing and disequilibrium, some through crowding-out of non-government credit.

Regime I: rules-based system (cf. the Franc Zone and Botswana¹²)

Here the rules constrain the government from relying on the central bank as a source of borrowing. A fiscal shock calling for additional borrowing can be met by foreign borrowing (if available), by borrowing from the domestic banking system, by borrowing from the domestic non-bank sector, or by running arrears.

To the extent that the banking system cannot refinance its borrowing with the central bank, government borrowing from the banks tends to squeeze out private bank borrowing (unless the banks have excess reserves which they can run-down or unless they are willing and able to borrow from abroad). Few private borrowers have alternative funding sources in the formal sector, and few can borrow from abroad. Interest rates tend to rise, and the reduction in private bank borrowing is transmitted into reduced private sector activity and investment.

The scope for formal borrowing from the African non-bank sector has always been limited. Even sizable interest rate movements induce little additional saving. Such funds as are made available to the government by the non-bank sector (including insurance companies and other institutional investors, some wealthy individuals and some corporations) come mainly

¹²We put Botswana into this box essentially because neither monetary financing of the budget nor credit to the banking system is an issue for the Central Bank, and even though it no longer maintains a fixed exchange rate against the South African Rand - indeed since 1991 there has been a depreciation of about 5 percent against the Rand. Botswana's exchange rate policy has been described as a basket peg with margins, the composition of the basket and the size of the margins both being secret. It is because of the government's large accumulated fiscal surplus that there is no question of the government needing to draw on credit from the central bank. Likewise, all of the banks hold very substantial voluntary reserves with the central bank. Finally, the Central Bank's foreign reserves greatly exceed the sum of its liabilities to the government, the banks and the holder of currency notes. Thus it is as if government and banks were holding foreign assets directly and the central bank was not involved in borrowing or lending at all. Fluctuations in the net fiscal position are absorbed through management of the government's asset balance. The Central Bank no longer offers subsidized interest rates and has a reasonable degree of statutory independence. But it has not neglected the development of the financial markets, its own bills representing an important asset in the local money market. This market operates smoothly with slightly positive real interest rates.

from a reallocation of their portfolios, involving a run-down of bank balances (again serving to crowd-out private bank borrowers) and perhaps of foreign assets.

An increase in domestic arrears also puts pressure on bank liquidity as the patient suppliers need to extend or increase their bank borrowing. Nevertheless, banks are more willing to lend to these particular borrowers, seeing them as ultimately credit-worthy (unless inflation is very high, so that the real value of their claims on the government is eroding), and may be ready to run-down liquid assets to do so.

One-off financing shocks can be financed in any of these ways, but continuing borrowing needs are constrained by the long-term financing capacity of the various sources. Ultimately, the government's ability to attract funds from the domestic sector is limited by national wealth; and its ability to borrow from abroad is limited by fear of default.

Regime II: the printing press (cf. Zaire)

The nominal value of bank deposits and of bank reserves adapt in proportion. The price of foreign exchange is just one of the prices which will tend to adjust proportionately to the increase in other prices. Time-varying deficits have disproportionate impact effects on prices. A steady rate of monetary expansion leads to steady inflation and exchange rate depreciation at the same rate.

There is a maximum size of deficit which can be financed in this way. At very high rates of inflation, the demand for real currency balances is so small, and so sensitive to further increases in inflation, that a higher rate of monetary expansion delivers lower real resources to the Government.¹³ Some countries may nevertheless find themselves pushed beyond this maximum revenue inflation rate: if the private sector takes some time to learn that the Government has shifted to a permanently larger rate of monetary expansion, greater resources will be transferred to the government in the transition.

Regime III: the controlled economy (cf. Ghana and Tanzania in the 1970s)

The consequences of fiscal deficits in an economy subject to extensive administrative controls and rationing obviously depend on the exact nature of the controls and on the ease with which they can be evaded through parallel market transactions. The case where the official exchange rate is fixed, but foreign exchange rationed, provides a benchmark for consideration.

We distinguish between the case where there is an active parallel market in foreign exchange and where that is not available.

¹³By restricting capital movements and the potential for currency substitution, and by imposing unremunerated reserve requirements the authorities may succeed in increasing the monetary base on which this quasi-tax is levied.

If there is a parallel foreign exchange market, an expansion of currency resulting from central bank lending to the government will spill over into depreciation of the parallel exchange rate. This in turn will increase the implicit tax rate inherent in surrendering export receipts at the official rate, thereby reducing the supply of foreign exchange to the official market, and worsening the fiscal deficit by shrinking the government's trade tax base (Kiguel and O'Connell, 1995).

If there is no developed parallel foreign exchange market, the private sector can still retreat into informal sector economic production. O'Connell (1994) has shown the consequences of an expansion of the government deficit in such a regime, where the government is financing its deficit with money that cannot be disposed of because imported goods have to be rationed, given the official exchange rate. Here too there is a limit to the size of the deficit which can be financed on a sustained basis. The negative supply response can ultimately reduce the supply of output to the formal sector to the point where the government is the sole purchaser.

Regime IV: the credit ceiling regime (cf. Nigeria, Zimbabwe¹⁴)

In this regime, credit to the private sector may be rationed, but other markets clear. The rationing of credit both facilitates non-inflationary deficit financing by channeling banking resources to the government, and, since it usually involves below-market interest rates, acts as a quasi-tax on depositors. The imposition of high reserve requirements on the banking system has a similar effect in terms of facilitating the channeling of funds to the government, and amounts to the same thing as a credit ceiling, especially if bank interest rates are controlled in the same way. In either case, the controls that free banking resources for the purposes of monetary financing of the government's deficit, whether from the central bank directly or from the commercial banks, will tend to squeeze out the private sector.

The major side-effect can be in creating disintermediation to what is in Africa a well-developed informal credit system (Aryeetey and Huya, 1991). To the extent that the informal system is less efficient in channeling funds to productive uses (a proposition which is clearly debatable) the growth of the economy may be impaired.

Regime V: the market-clearing regime (cf. Kenya)

The final regime corresponds to the text-book optimization for a modern central bank in a liberal, market-oriented system. The government has to pay market rates of interest on borrowing, and may not be at liberty to borrow from the central bank at all. Optimal reliance

¹⁴Since 1991, interest rates have been liberalized in Zimbabwe and it has thus moved away from regime IV. Exchange rate policy is focused on stabilization of the real exchange rate. Whether Zimbabwe should now be seen as closer to regime V or, because of the adoption of cash budgeting, to regime I is a moot question. Current financial policy issues in Zimbabwe focus more on the development of nonbank financial markets.

on seigniorage would be characterized by a positive correlation between seigniorage and other sources of tax revenue, assuming that there are positive and increasing marginal costs associated with each distortionary tax instrument.

Because of the side-effects noted for the first four regimes, continued high fiscal deficits tend to result in increased evasion, thereby generally reducing the maximum flow of financing that can come from them, and worsening the magnitude of the distortions for any given deficit. The deterioration in economic efficiency is felt by governments which try to find less distorting ways of financing the deficit and may be induced to take steps, including improvements in the tax system, that will help reduce the deficit. They will also take steps to alter the institutional arrangements which have led them to rely on the more distorting ways of financing the deficit and may tend to converge on Regime V.

IV. IMPACT ON GROWTH AND VOLATILITY

A. Stylized Monetary Facts for Africa

Our perception of the impact of the different monetary regimes on economic performance relies on a number of basic propositions. Thus, we suppose that monetary expansion results in inflation, that higher rates of inflation discourage money holding, that availability of credit helps investment, and that growth may be negatively related to government's share in credit. These propositions have been extensively considered in the literature, often using formal and sophisticated techniques. But it is worth verifying that cross-sectional African data is not obviously inconsistent with these stylized facts.

The first two propositions essentially concern the demand for money. Econometric stability of African money demand equations tends to be weak (a problem not unique to Africa).¹⁵ Figures 2 and 3 suggest, however, that macroeconomic variables are nonetheless tied together by a long-run money demand relationship whose qualitative features are reasonably uniform across countries and over time. Figure 2 shows long-run values for inflation and nominal money growth in a cross-section of African countries. Not only is the relationship linear in the logarithms, but its slope is one, as predicted by the simple quantity theory. Figure 3 shows the relationship between inflation and monetary depth. The latter variable is measured as the ratio of broad money to GDP, so a long-run money demand equation would suggest a negative association between these variables. The figure contains

¹⁵This seriously complicates the conduct of monetary policy, particularly given the recent move of many countries towards indirect methods of monetary control. See Adam (1994), Domowitz and Elbadawi (1987).

Figure 2: Quantity Theory of Money in Africa

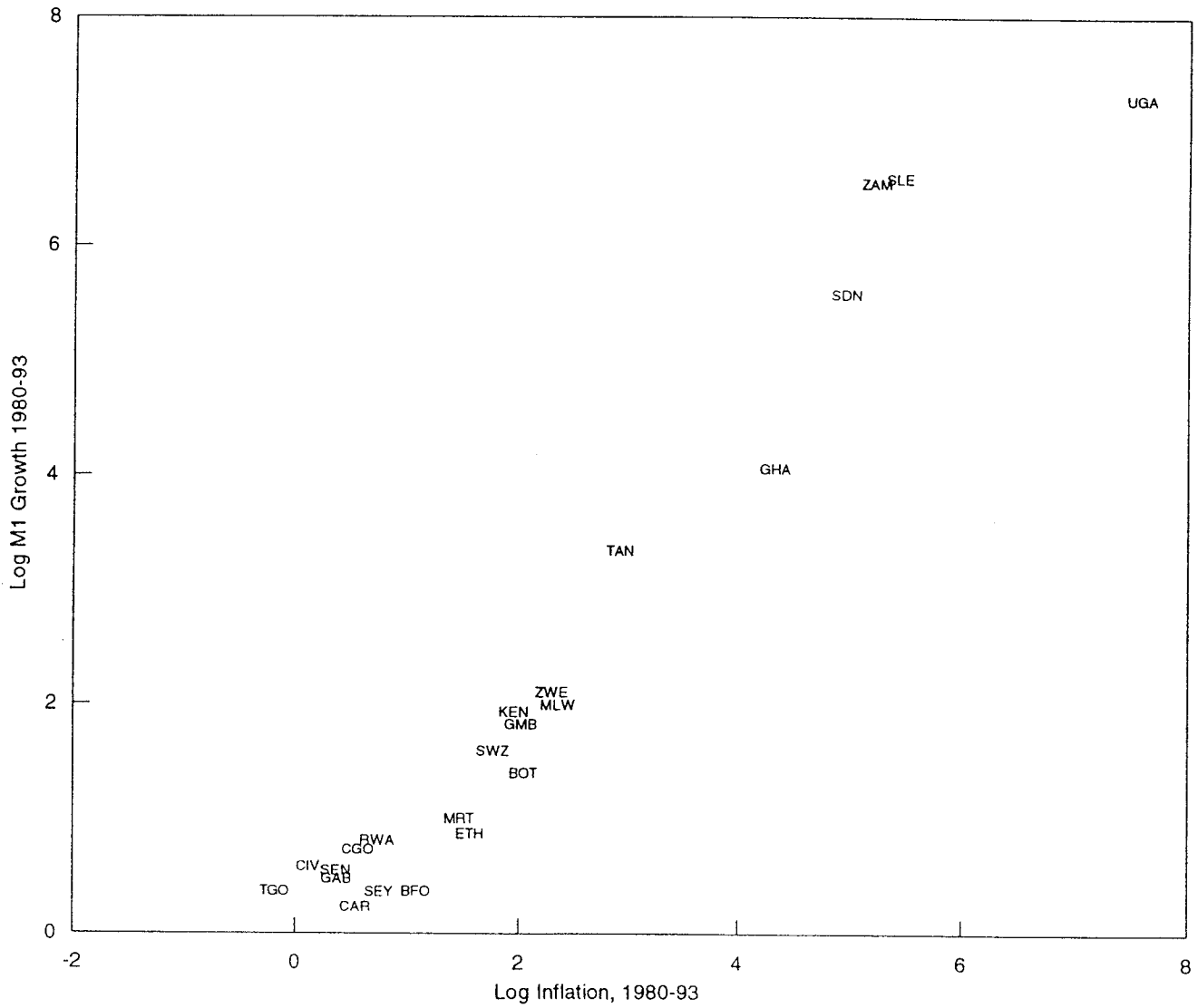
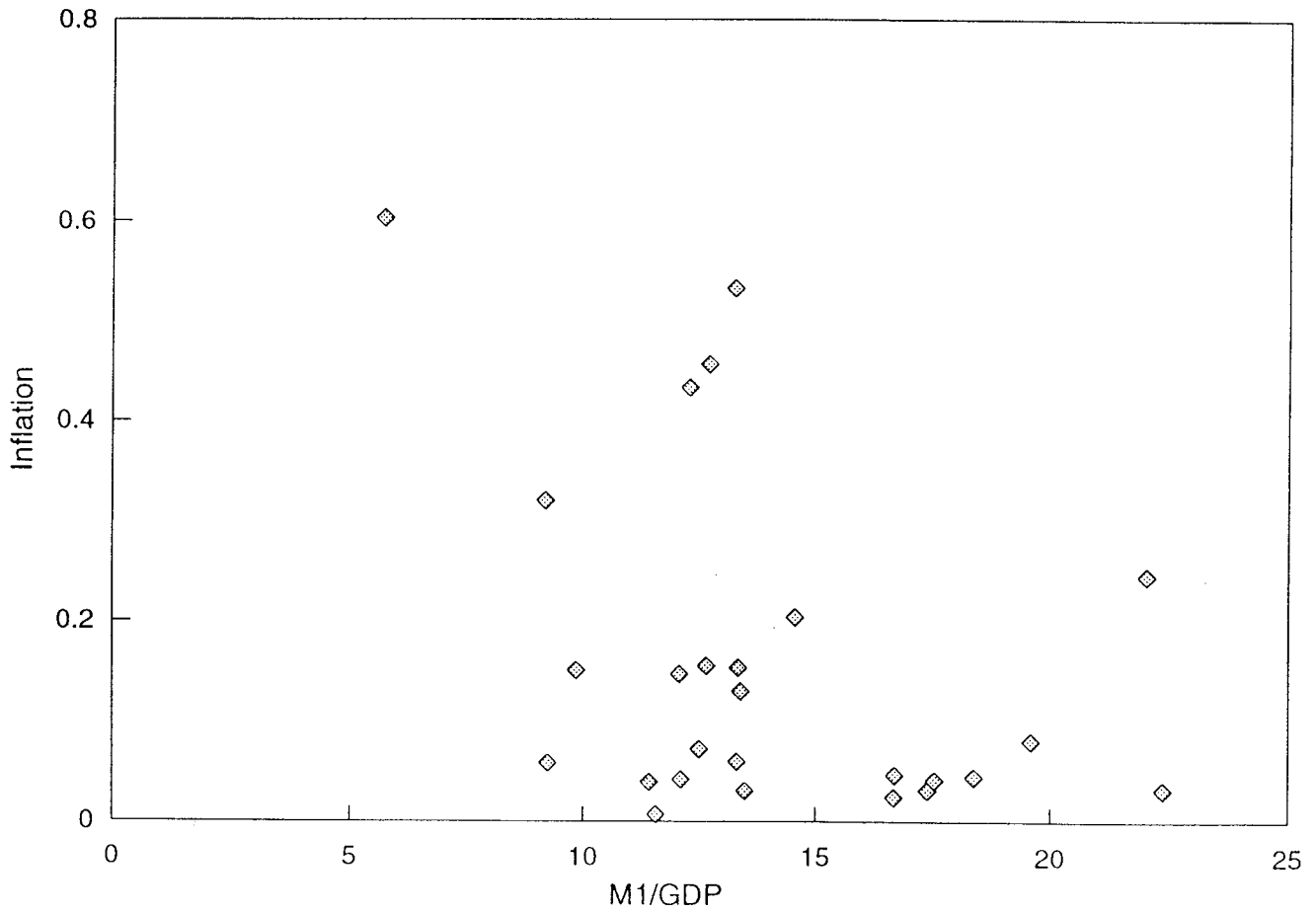


Figure 3: Money and Inflation in African Countries
Average 1980-92



two classes of country: a group that follows the predicted negative relationship, and another group which, though they enjoy relatively low inflation, also have relatively low money holdings. The CFA countries are disproportionately represented in the latter group. Overall, the relationship is not very strong, but it is not inconsistent with the conclusion of many time-series studies that money demand is negatively affected by inflation (a conclusion which is conditioned on other variables, including interest rates and output).

As to the question of availability of credit, this could be a serious constraint on growth especially if, as has been suggested¹⁶ information asymmetries already limit the scope for non-government borrowing and result in potentially high-yielding investment projects remaining unexploited. This emphasis on the potential of private sector credit is also adopted by Pill and Pradhan (1995), who suggest that financial liberalization is not complete until private sector credit has reached what would be demanded if the private sector had access to funds at the world interest rates. They note that the evolution of domestic credit (as a share of GDP) in six African countries¹⁷ has been very slow, in contrast to the sharp increases experienced by liberalizing Asian countries.

Some evidence on the longer-run importance of formal bank finance in African countries is provided in Figure 4, which shows the cross-country relationship between aggregate investment and monetary depth in Africa. The negative relationship in the data is more evident (and statistically significant) when the outlying observation for oil-rich Gabon is excluded. Though this kind of relationship holds for both credit and money-based measures of financial depth, it is at least consistent with what King and Levine (1993) interpreted (using worldwide data) as a causal relationship between most measures of financial depth and growth. Figure 5 provides some comfort for the same view, in that (Cote d'Ivoire and Niger aside - and the importance of government-controlled state enterprise borrowing in those countries is well-known) a negative relationship between growth and the government's share of total domestic credit position emerges. We may conclude that crowding-out is at least potentially an important contributor to slow growth.

¹⁶The high risk environment facing banks in Africa has often been noted. Policy instability, inadequate mechanisms for loan enforcement and collection, and high costs of assessing creditworthiness all increase the perceived riskiness of loans relative to government securities and reserves. Lack of information gives force to the adverse selection reasons inhibiting banks from raising interest rates sufficiently to clear the loan market even when there are no interest rate controls. This may help explain the frequent incidence in Africa of banks holding excess reserves, although a lack of interbank markets may make this an attractive form of self-insurance even when adverse selection is not an issue (Caprio and Honohan, 1991).

¹⁷The Gambia, Ghana, Kenya, Madagascar, Malawi, Zambia.

Figure 4: Money and Investment in African Countries
Average 1980-92

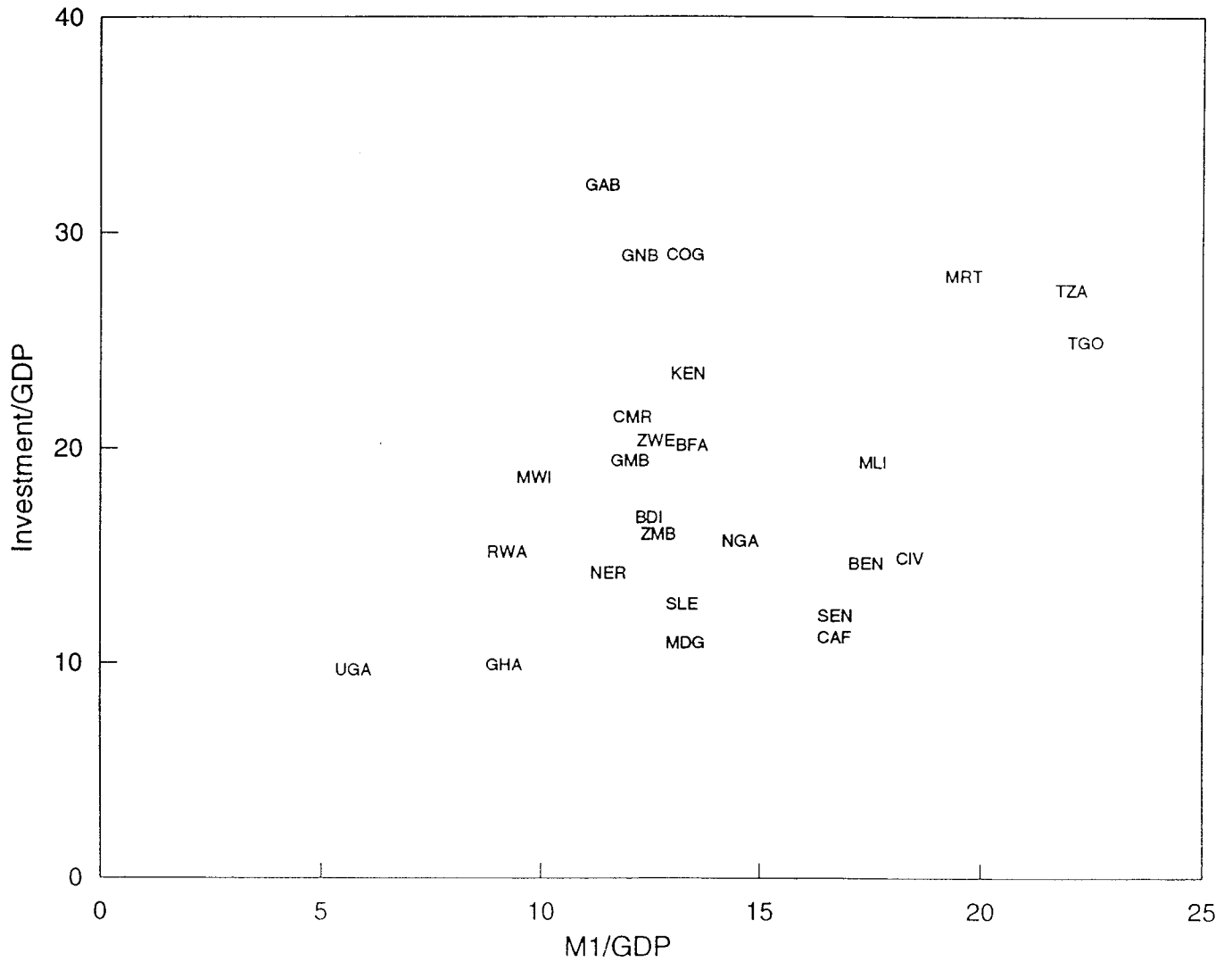
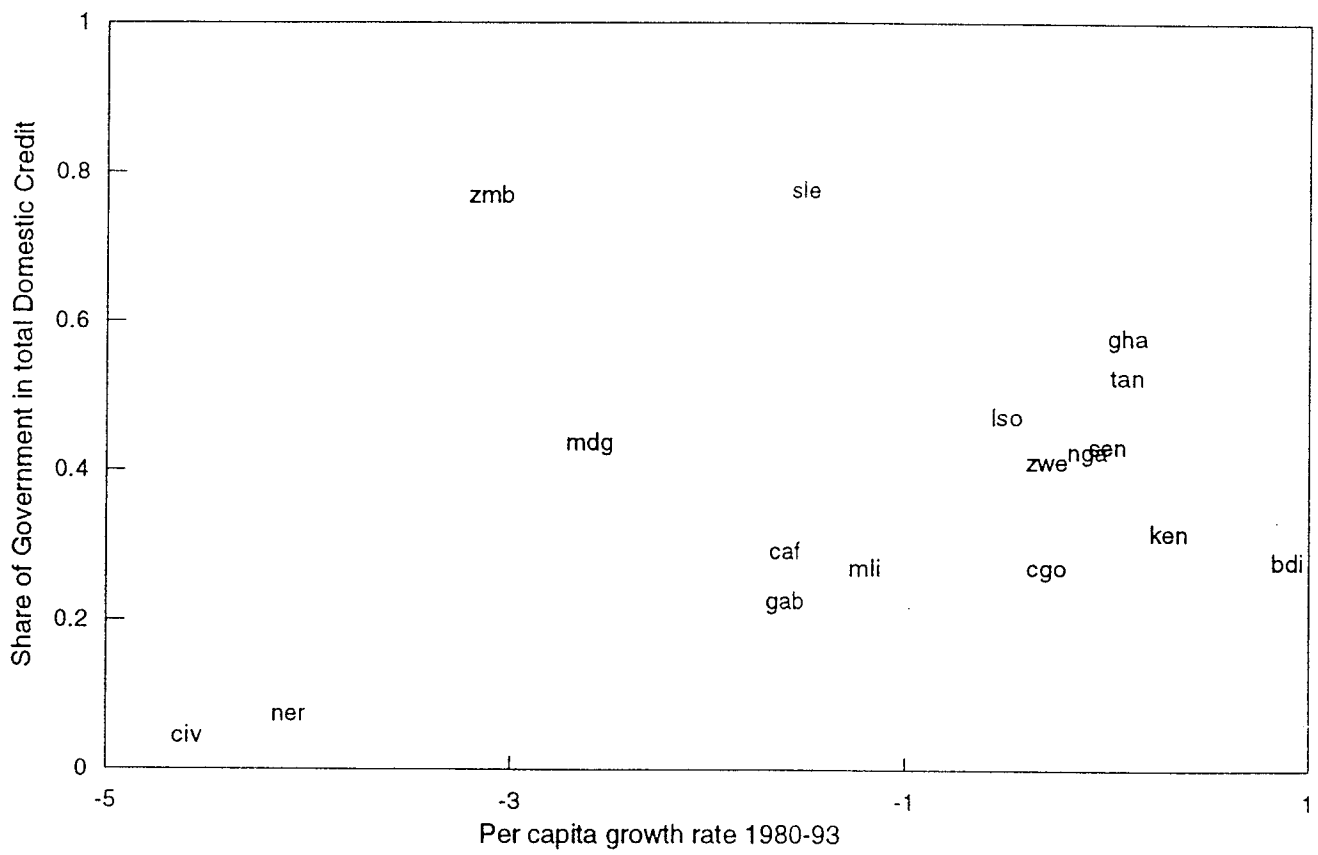


Figure 5: Growth and Government Credit Share



B. Monetary Pressures and Economic Performance in the Long-Run

It is not easy to obtain conclusive empirical evidence as to the overall impact of the different monetary regimes on African economic performance. Part of the problem is that regimes do change and we do not have a sufficiently long run of experience with any particular regime - if we had, there would be the possibility of examining the issue in the context of a Barro-type regression. The remainder of the problem is of course that monetary developments are but one of the factors affecting growth performance and that (over the longer run) they are themselves endogenous.¹⁸

Figure 6 displays the growth and inflation performance of different countries in particular decades (essentially the 1970s and 1980s), identifying the countries only by their regime (following the classification of Table 1). Evidently regimes II and III have seen higher inflation than IV, or especially I, but there is not enough evidence here of a clear growth link. (Growth and inflation data are missing for several II and III countries).

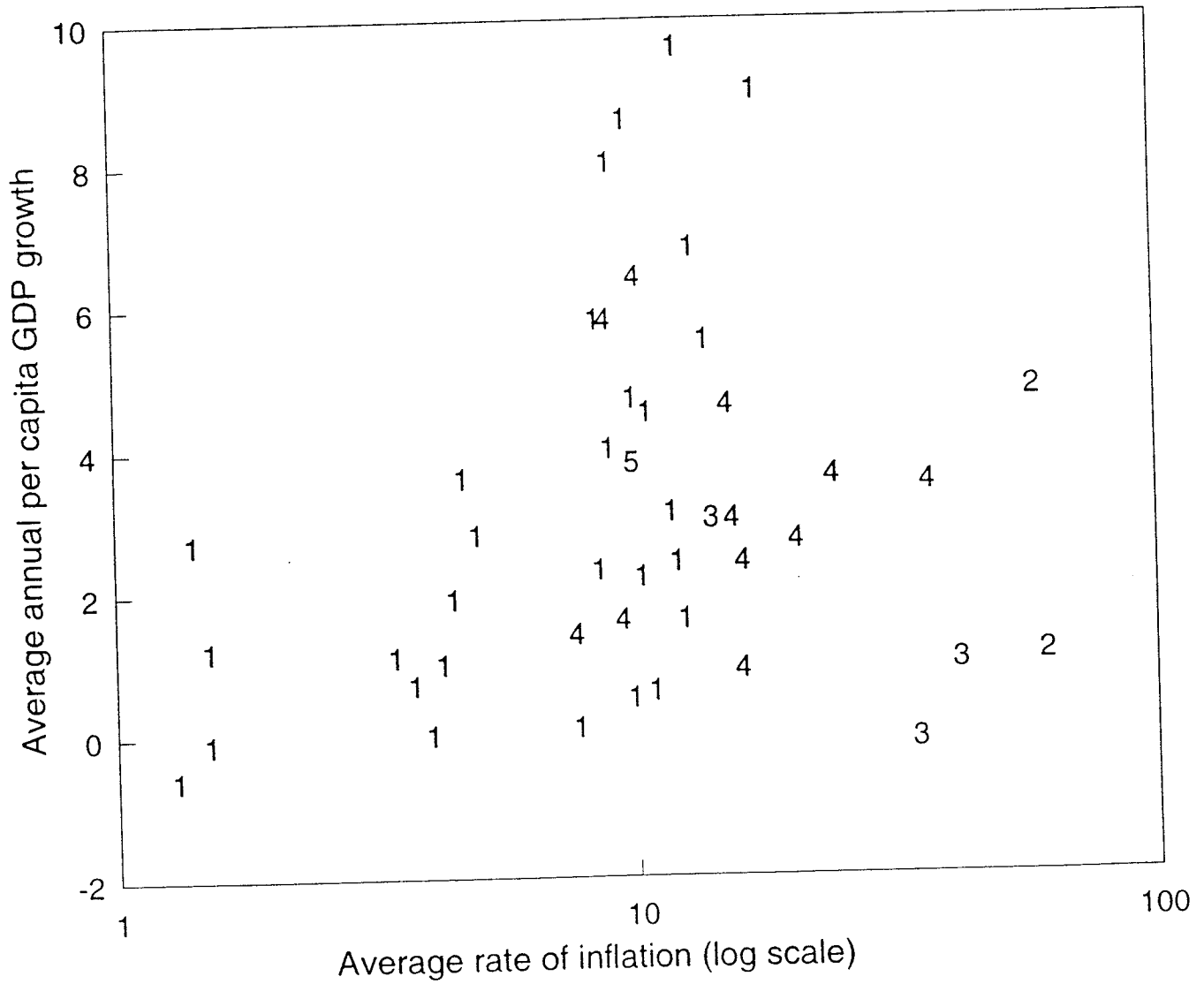
But the above discussion of the interaction between fiscal policy and the monetary regime highlights the fact that fiscal pressures can be met not only through either inflation, but also through some form of crowding-out. Clearly, whether manifested in inflation or crowding-out, heavy fiscal reliance on the monetary system damages growth. But it is less clear which mechanism has been more damaging, and thus where the balance of advantage between different regimes lies.

A steady-state analysis (such as sketched in Appendix I) suggests certain conclusions about the potential impact of sustained fiscal pressure in different regimes. Thus, if output growth requires availability of credit to the private sector, and if inflation also damages potential growth, the degree to which financing a given deficit may damage growth will depend on how it affects inflation and availability of credit. In the model of Appendix I, the government can choose between taking a larger share of available financial savings (on the one hand) and increasing the rate of inflation (on the other). If the deficit is too big, then growth will be damaged whatever monetary regime is in effect. Conversely, if the deficit is not too big, then there may be combinations of crowding out and inflation which allow maximal growth to be achieved. But if inflation-financing alone is employed, this may damage growth. By the same token, if crowding-out alone (zero inflation) is used, then growth may also be damaged. Thus both of the automatic regimes, I and II, may perform badly in the face of heavy fiscal pressures.

This discussion highlights the fact that monetary financing of the deficit has an additional dimension to that of inflation. The apparent lesson is that the combination of a rigid adherence to price stability with an excessive government deficit may have damaging effects

¹⁸A recent review of the econometric literature on Africa's growth performance is contained in Bertocchi and Canova (1996).

Figure 6: Growth and inflation
Experience of different regimes



through crowding out of private credit. If the deficit is truly irreducible, a more flexible monetary regime might give a better outcome. Better still, the deficit should be adapted to what can be financed in a non-inflationary manner without crowding-out.

Actually, it seems that on average over the years African countries differ more in the degree to which they have relied on monetary financing of whatever type than in their choice between inflation and crowding-out as means of financing. Plotting the mean inflation rate against the mean value of the share of central government credit in total credit for two dozen countries yields Figure 7.¹⁹ To that extent, therefore, the comparative advantage of alternative monetary regimes is likely to have shown up more in their response to shocks than in their long-term financing role, and it is to that which we now turn.

C. Transmission of Volatility in Different Regimes

Recent literature has stressed the role of policy variability, and volatility in general, in influencing growth (e.g. Aizenman and Marion, 1993). The financial system is one of the major mediators of volatility, and has the potential to absorb volatility, or to channel to where it is best absorbed. Its performance in this regard depends on the choice of regime. We should therefore think of regimes not only as transmitting individual shocks in different ways, but as converting volatility of fiscal and other shocks into volatility of other indicators.²⁰ Volatility cannot be wholly suppressed; each regime channels volatility into a particular part of the economy.

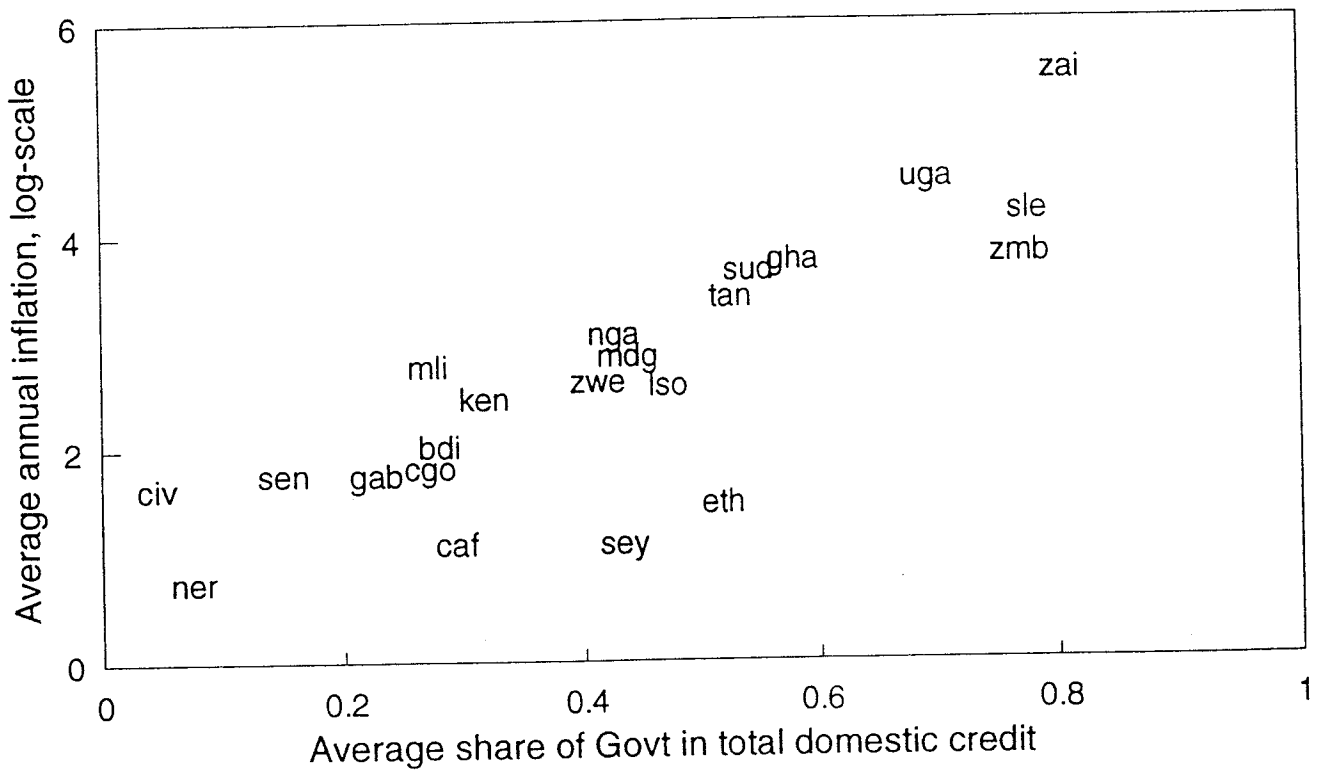
Regime I implies increased volatility of the real economy while nominal magnitudes are stable. This probably explains what we see in the evolution of the real sector in many of the Franc Zone countries: so buoyant up to the early 1980s, and so depressed since then. Botswana has managed to avoid the downside here through the use of a substantial buffer-stock of international reserves. Of course, the whole point of having the rules is to force fiscal policy into a sustainable stance. When discipline and confidence are weak, this may be a valuable mechanism, despite its drawbacks.

Regime II clearly increases nominal volatility: of exchange rate as well as prices. Not only is the average inflation rate high, but it is highly variable. Conventional wisdom declares that such volatility may discourage investment plans and reduce the rate of potential output

¹⁹In this case public enterprise credit was not included with Government credit.

²⁰Although we have emphasized the fiscal impact on monetary policy, other shocks are also important, including terms of trade and other disturbances to the external current account, domestic supply shocks and confidence shocks affecting the demand for money.

Figure 7: Inflation and Government Credit



growth. The poor output performance of Zaire and Sierra Leone has gone hand in hand with extremely volatile inflation.

Regime III displays volatility in the availability of goods or foreign exchange in the official markets and in the ratio of official to unofficial or parallel market prices. The disruption caused by such rationing reduces economic efficiency and discourages investment.

Regimes IV and V introduce an additional dimension: the availability (IV) or price (V) of credit. Volatility in availability or price of credit respectively characterizes each of these regimes. Here the policy objectives being sought are more complex, as both price and output stability are explicit policy goals, to be traded-off where necessary. While the regime which allocates credit according to interest rates should have better efficiency performance, it does in turn require a greater development of financial markets, and without such development, policy may not be as successful in reaching its goals. So it is not obvious which regime should be expected to contribute more to output and price stability.

Because Regimes IV and V allow for a trade-off between output and price stability, there may be a presumption that they will do better overall than the others, if the contribution of monetary policy to aggregate economic welfare is measured in these terms. Regimes II and III are clearly inferior, and the economic performance of countries like Ghana and Tanzania in the 1970s, and Zaire confirm this perspective. The case of Regime I is more subtle and leads us to consider second order effects of regime choice.

Thus, at a second approximation we must also recognize that the existence of a regime may alter the behavior of private agents, and of non-monetary parts of the government apparatus. Flood and Rose (1995) have provided empirical evidence for industrial countries that fixing exchange rates did not simply result in greater volatility elsewhere in the economy; in their view the volatility evaporated. This is probably because they helped stabilize expectations. Likewise, a regime which provides limited recourse to the monetary sector for easy financing of fluctuations in the government's deficit may have the effect of reducing such fluctuations.

The franc zone's failure shows that this kind of effect is not always strong enough. Fiscal pressures and terms of trade shocks were too great for that fixed rate regime to survive, especially when no buffer-stock of foreign assets was built-up in good times.

Some light is thrown on the empirical relevance of volatility by a scatterplot of the (log-) variance of inflation rates against average per capita growth.²¹ Dominated by a few outliers, the relationship is strongly negative (Figure 9a). Volatility of inflation is associated with lower output, as has been found worldwide. But even looking at the middle of the plot

²¹The relationship between the average level and the variability of inflation in the data is a non-linear one, as is evident from Figure 8.

Figure 8: Inflation: level and variability

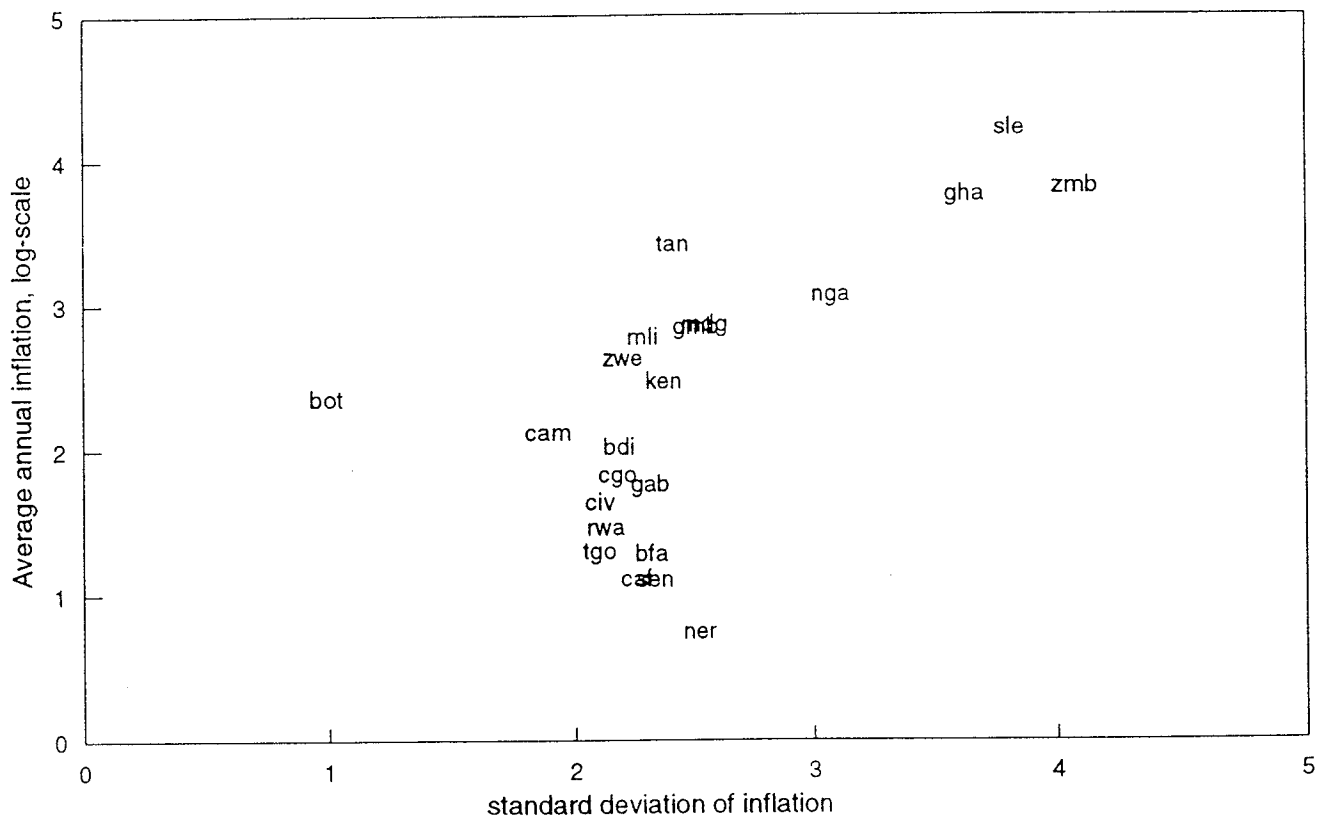
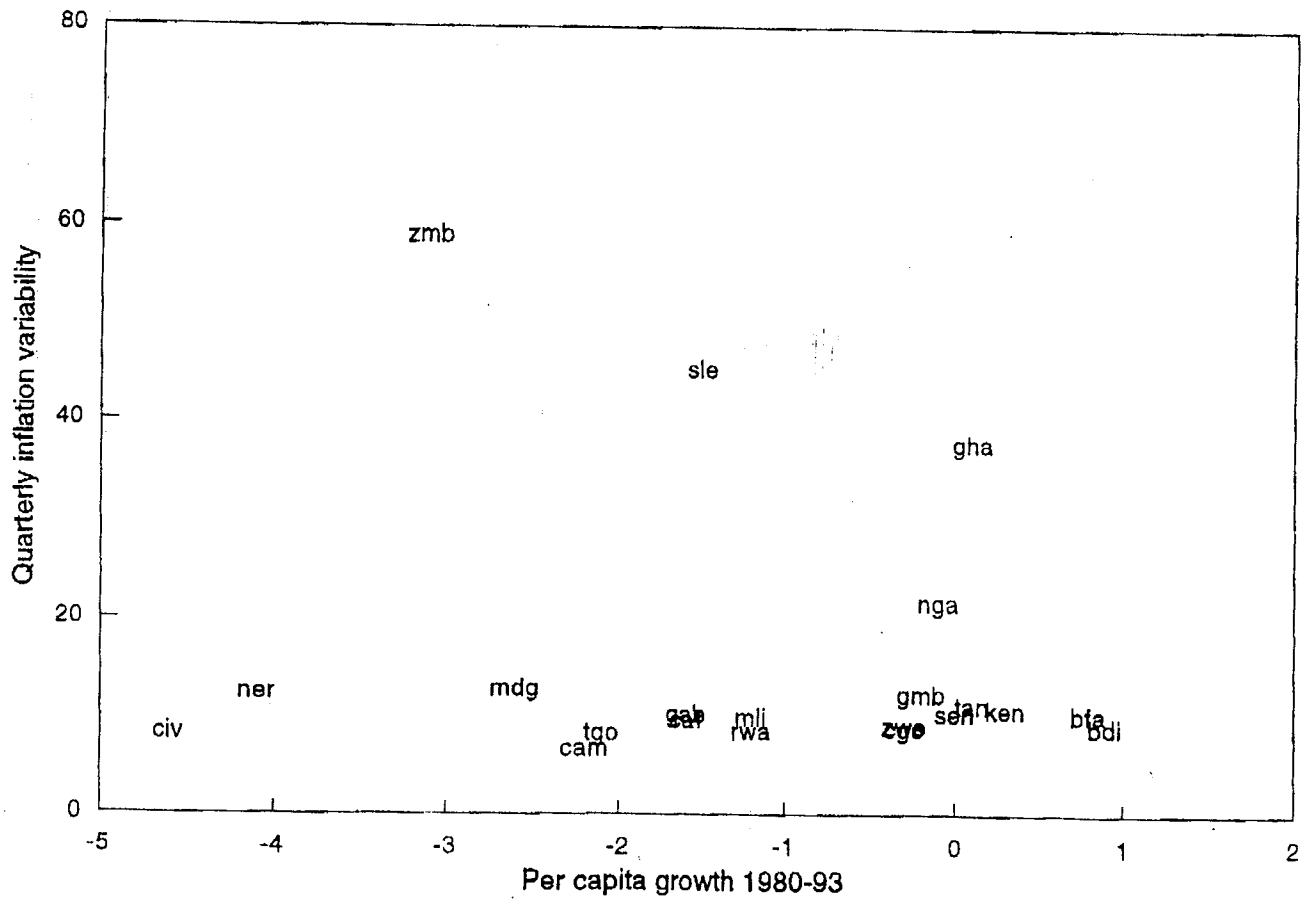
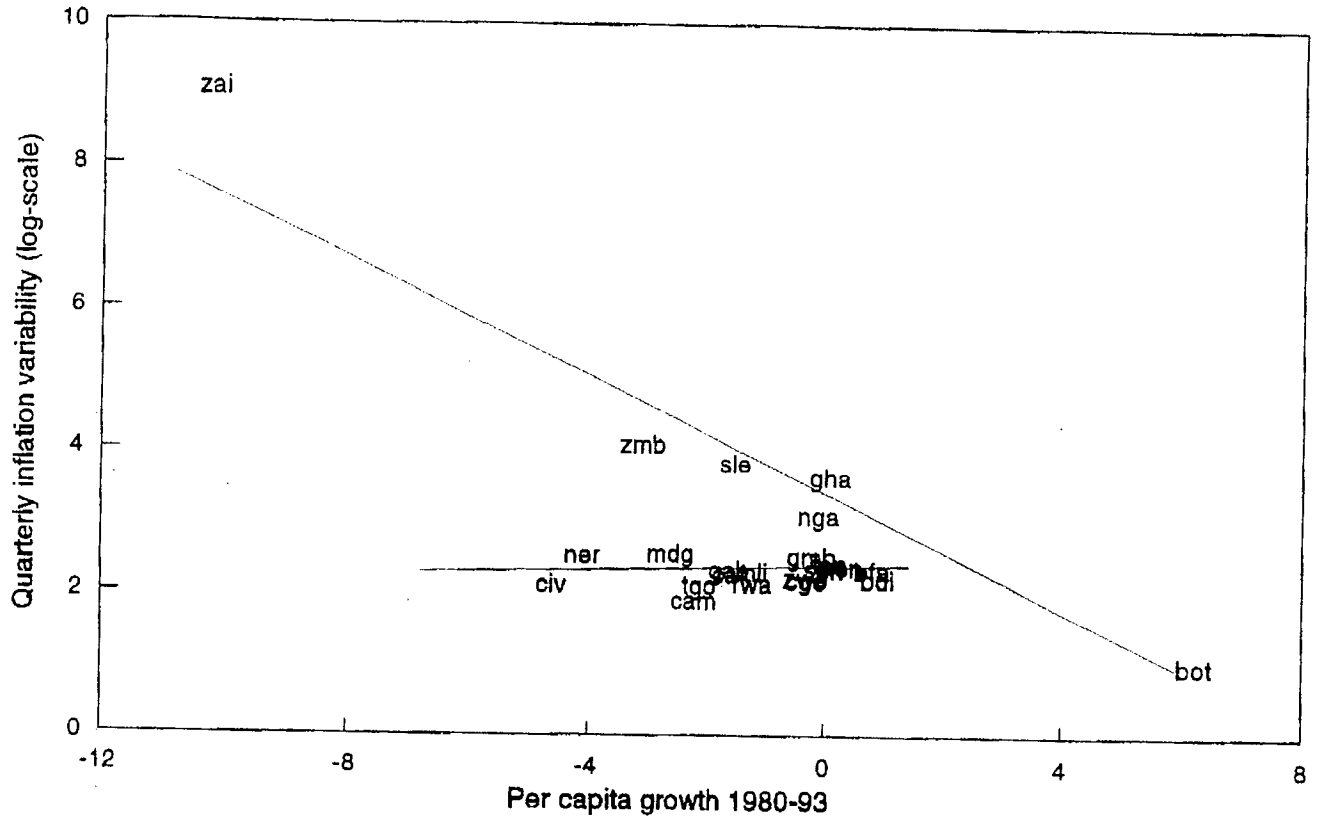


Figure 9: Inflation Variability and Growth



(Figure 9b) it does seem that the major deviations from a single negative relation are the franc zone countries whose obsessive emphasis on inflation stability without the necessary supporting policies provide both the exception that prove the rule and a caution against pre-occupation with nominal stability at the cost of real stability.

V. ACHIEVING SUCCESSFUL TRANSITIONS

The high inflation and goods entailed in Regimes II and III mean that these regimes have no current advocates. Regime IV, with its credit rationing, is also going out of favor, though many argue for caution in abandoning it for the full fury of the market. Thus, many African countries have recently found themselves facing the challenge of accomplishing a smooth and credible transition either to a rules-based system, or to increasing exposure to the market. The consequences of liberalization in particular can be trying; they can include a credit surge, sharp increased in interest rates, and sometimes (if competition is weak) to a widening of spreads between deposit and lending rates). Establishment of credibility in the new, deliberately chosen, regime can be difficult, and this is equally true of a rules-based system.

To illustrate, we briefly review in this section some recent regime shifts. First, the reaffirmation of an open, but rules-based system in the CFA zone with the devaluation of 1994; and then the recent transitions towards increased reliance on market forces in Tanzania, Ghana and Kenya.

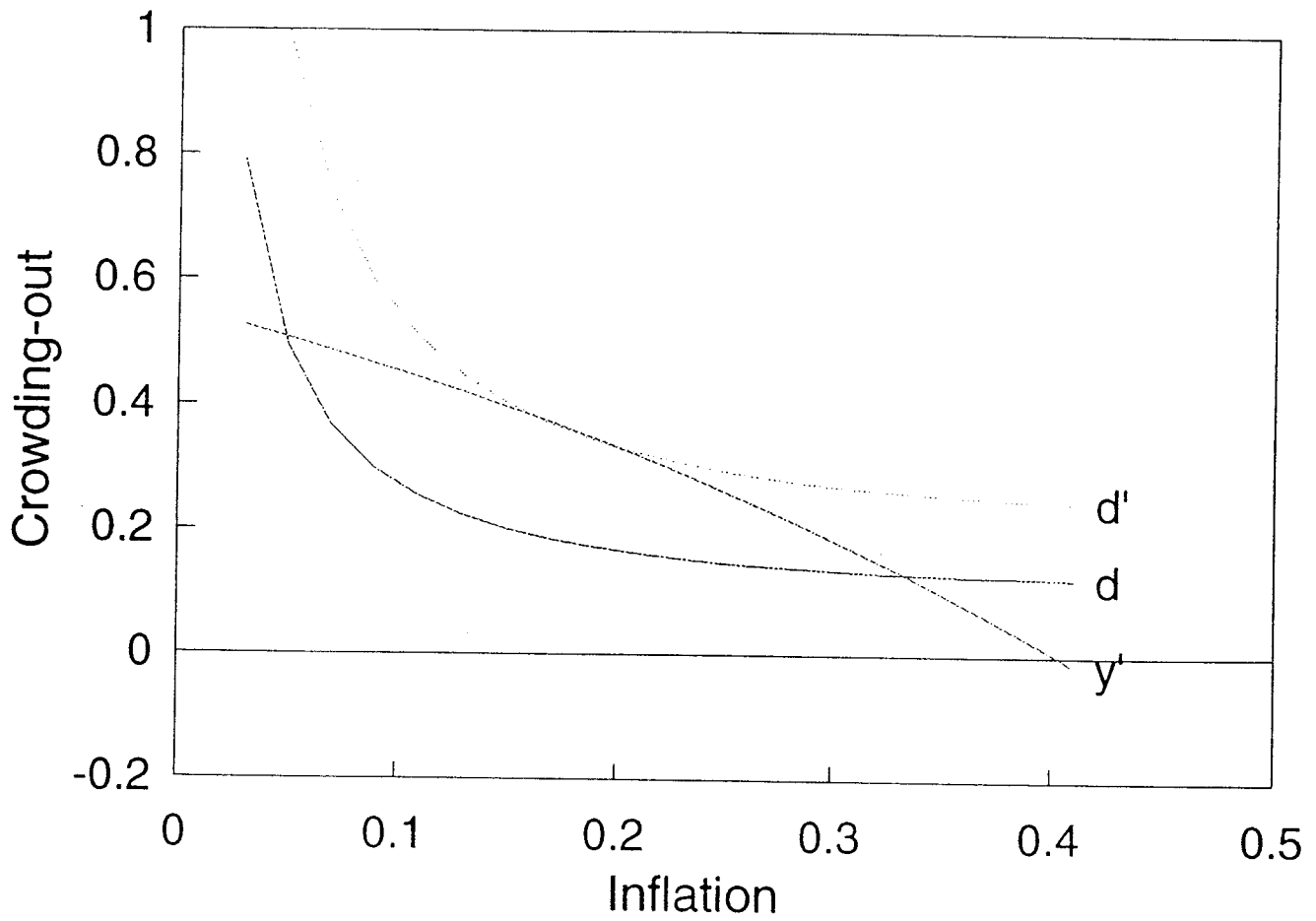
A. The 1994 Devaluation of the CFA Franc

The 1994 devaluation of the CFA franc is one event which may possibly be interpreted as a regime shift, though officially nothing has changed except the exchange rate. Of course (as mentioned) the CFA arrangements never were a pure currency union in the textbook sense, as the regional central banks have always disposed of much greater powers than the narrow restrictions of the textbook currency board would allow. But they did display absolute exchange rate fixity against a single peg for almost half a century (and for over thirty years after independence) and central bank lending to the government was constrained.²² Indeed, in the period immediately preceding the devaluation almost all of the CFA governments were at (or above) their borrowing ceilings with their central bank, and the central banks in turn were heavily indebted to the French Treasury, essentially precluding any expansion of credit at home. So this was still a rules-based system.

The challenge at devaluation was therefore to ensure that the change of peg did not dissolve all remaining credibility in the rules. Coincident with the devaluation, interest rates were raised sharply, reaching a 700 basis point spread over Paris. The purpose of this action was clearly to signal commitment to the new peg, to dispel any market perception that the devaluation foreshadowed a period of lax monetary policy and to encourage a reflow of the

²²Although CFA governments found indirect methods of tapping central bank funds, mainly through bank financing of parastatals and suppliers.

Figure 10: Combinations of inflation and crowding out for deficit financing (d) and capacity growth (y)



capital which had flowed abroad in anticipation of the devaluation. The results were encouraging and the banking system recovered substantial liquidity. Furthermore, although domestic price levels increased as the cost of devaluation was passed through, they did not double, as would have been implied by purchasing-power-parity. The overall surge of consumer prices in the first two years after the devaluation was only of the order of 50-60 percent on average.

Can we conclude that the CFA regime has weathered this maxi-devaluation to resume its former adherence to a fixed parity? The early indications are favorable. The devaluation was large enough to remove cost competitiveness as a major constraint, and the relatively moderate response of domestic prices and wages means that the authorities' stated adherence to a fixed nominal parity may not be tested again for several years.

B. Convincing the Market of a Regime Change: Tanzania, Ghana, Kenya

By the mid-1990s many African countries had legislated a drastic reduction in the degree of administrative control and rationing in the financial sector. But had they really migrated to regime V from III or IV? Certainly there is evidence that markets were not always convinced. We look at the experience of Tanzania, Ghana and Kenya.

Take the case of Tanzania, where a new Bank of Tanzania Act was passed in February 1995 freeing the Bank from extraneous functions such as administration of import controls. Under a strong and widely respected leadership, the Bank presided over a programme of liberalization of exchange and payments, and a move towards market-determination of interest rates through the Treasury bill auction. But the outcome of these auctions hints at teething problems. With a nominal Treasury bill yield of 40 percent per annum (compared with inflation running at about half that) it seems clear that the markets were unsure of the status of the new policy regime. They may have been unconvinced that liberalization of interest rates was sure to be accompanied by fiscal restraint or perhaps they expected a return to administrative controls (and indeed some credit ceilings were reimposed, and under-remunerated reserve requirements raised). The fiscal explanation is particularly plausible given the Government's inability to improve the effectiveness of tax collection and to keep expenditure under control despite the cash budget that is supposed to be in effect.

But it is also worth noting that the banking system in Tanzania remains dominated by the National Bank of Commerce, whose non-performing loans, especially to parastatals, places it in a difficult position. Some observers have argued that the high real interest rates observed in many countries following deregulation of interest rates should be attributed to oligopolistic behavior of the banks. Such behavior is accentuated when a dominant bank is experiencing solvency problems and needs high interest margins on that part of its portfolio that is performing in order to survive.

Tanzania's experience seems to reveal some of the transitional difficulties involved in changing regimes: building confidence, institutional reform and fiscal restraint are all needed for a successful move to V.

Ghana is another country which has recently put substantial reforms in place on paper, without yet achieving a substantially market-oriented financial system. The colonial legislative inheritance has been replaced with a modern statute establishing greater *de jure* independence for the Central Bank. The exchange system is substantially free. However, observers note the apparent continuing *de facto* influence of the Ministry of Finance in monetary and financial policy, partly exercised through moral suasion and its ownership (until the 1996 privatization) of the dominant Ghana Commercial Bank.²³ Despite the auction system for bills which is in place, wholesale interest rates are still subject to official influence, with the authorities evidently reluctant to see them rise too much. Thus in 1995 the nominal discount rate on Treasury bills remained below 40 percent per annum while inflation was climbing to 70 percent per annum. Again the fiscal position has been a major source of instability, with a major spending boom in 1992-93.

Despite less extensive legislative changes, Kenya may have gone further along the path toward regime V than Tanzania or Ghana. All direct controls on credit were removed from mid-1991 and an active Treasury bill market has been used for the purposes of open market operations since 1992, though the Central Bank does not hold Treasury bills for its own account. Reserve ratios, fluctuating between 6 and 20 percent, have been actively manipulated especially for the purpose of absorbing fluctuations in capital inflows: these requirements are remunerated at close to market rates at the margin, so their use does not represent a backward step.²⁴ Fiscal pressures have not been the only, or even the most important, source of shocks to the Kenyan financial system in recent years: monetary management irregularities during 1992-93 generated considerable turbulence, and they were succeeded by surging capital inflows (largely driven by private banks and other residents repatriating funds to take advantage of real interest rates as high as 18 percent on Treasury bills). These fluctuating inflows had the effect of generating wide swings in the value of the Kenya Shilling raising politically sensitive issues of competitiveness. More recently, fiscal pressures have once more become an important source of financial market disturbance. Despite the evidence of market-oriented policy, it appears that (perhaps due to lack of competition) increases in wholesale interest rates are not fully or speedily transmitted to retail bank deposit rates.

Kenya's experience too with regime V thus suggests that, especially in the early stages of transition to this open market-oriented regime, the task of monetary management becomes more complex rather than less.

²³The state-owned banks in Ghana were recapitalized in the major structural reform of the banking system accomplished in 1990.

²⁴Past irregularities have led to use of the discount window being largely abandoned.

VI. CONCLUSIONS

Our focus in this paper has been primarily historical rather than looking forward to the impact of ongoing or proposed reforms. Much can be learnt from the past (albeit with due regard to the Lucas critique) without requiring a reductionist approach to policy lessons.

The choice of monetary policy regime has strongly influenced the reaction of African economies to macro-economic and especially fiscal shocks. Some countries retained a rules-based monetary system which has restrained inflation, though possibly at the cost of lost output. Some have responded to shocks with outright inflation, some with repressed inflation and administrative controls. The private sector's access to credit and the nominal and real cost of credit have also been strongly influenced by the use of reserve requirements and credit ceilings.

We identified five main regimes which encompass the African monetary experience in the years of independence. It is evident that some of the regimes are clearly inferior. The relative merits of the others remains disputed:

The rationed economy, regime III, is defective for obvious reasons and is dominated by others. That is why it has been progressively abandoned by more and more African countries.

The printing press, regime II, represents a failure of political and administrative structures and is a default to which the system is driven under extreme fiscal pressure. The high and volatile inflation which it generates is only one symptom of the associated resulting economic malaise.

Rule-based systems, such as the currency board (I), help to combat political weaknesses and generate low inflation, but at the cost of being somewhat inflexible to shocks. There are certainly circumstances under which rules-based systems can give better overall performance in terms of fiscal discipline and greater stability for the private sector.

The discretionary central banks (IV, V) have more instruments and thus higher performance might be attainable, but they are harder to manage, especially with their vulnerability to shifting expectations. They have not always led to low inflation, nor have they avoided crowding-out of productive borrowers.

Though many still defend the appropriateness of the rules-based systems for African conditions, the trend of the future seems to be towards the more flexible regimes. Even with flexibility, though, excessive fiscal pressure can result in the private sector being starved for funds (thereby slowing growth), or in macroeconomic volatility that itself damages economic performance. The transition to greater flexibility can itself exacerbate problems of credibility and of macroeconomic management generally.

It remains to be seen whether the cycle of evolving monetary regimes which we have observed for Africa, finds any echoes in the early decades of independent monetary policy in the newly independent states and other Transition economies.

Some Algebra of Crowding-out and Inflation

Financing the public sector has been one of the central features of monetary policy in African countries. This Appendix provides a very simple model in which to consider the trade-off between two of the main implications of monetary financing of public deficits, namely crowding-out and inflation.

In the model the government can choose between taking a larger share of available financial savings (on the one hand) and increasing the rate of inflation (on the other). Among the means of increasing the government's share are higher reserve or liquidity requirements, compulsory investment ratios or directed credit to government, or government-related borrowers. In contrast, by borrowing funds from the central bank, thereby increasing base money, inflation inevitably ensues. Here we are not looking at a particular policy regime, but simply at the alternative ways of financing a government deficit by monetary means, and their impact on the real economy.

In order to sidestep the complications of interest payments, evolving expectations and convergence, the model focuses on a stationary state with non market-clearing interest rates. Working within an endogenous growth paradigm which allows for such dependence, we assume that output growth is constrained by availability of credit to the private sector, and is also inhibited by inflation. In other respects we make assumptions designed to capture essential features of some of the regimes discussed in the text. For present purposes it is useful to focus on an extreme case in which there is no capital mobility and that domestic firms have no substitute for bank credit as a means of financing investment. This provides an important supply-side role for bank credit.

As we will see, the authorities effectively can choose the rate of inflation π and the government's share of credit ϕ , though the latter cannot exceed unity. Because total resources of the monetary system (as a share of output) are negatively related to π , credit to the private sector proves to depend negatively on both π and ϕ .

The model

We model a banking system which holds high-powered money H and loans L , and issues deposits M . Currency and capital need not be considered in this context. High-powered money yields no interest and must equal a fixed proportion ϕ of deposits. Loans carry a (possibly controlled) interest rate i , given which deposits carry a lower interest rate $(1-\phi)i$ which is just low enough to allow the banks to break even. The supply of deposits grows in proportion to nominal output PY , but is sensitive to the real interest rate $(1-\phi)i-\pi$, where π is the inflation rate.

The government must finance a deficit D by increasing its take from the financial system: $D = \Delta H$. If we write the ratios of D , H and M to nominal output as d , h , and m respectively, and the growth rate of output as g , then the government's budget can be written as:

$$d = (g + \pi)h + \Delta h. \quad (1)$$

And taking into account the binding reserve requirements, $h = \phi m$,

$$d = (g + \pi)\phi m + \phi \Delta m + m \Delta \phi. \quad (2)$$

This expresses the familiar double aspect to monetary financing: the inflation rate and real growth both help finance the deficit in proportion to the pre-existing size of high-powered money in the economy, but so too does an increase in that relative size. The government is obtaining resources through seigniorage and the inflation tax, but it is also obtaining resources through an expansion in its share of the funds coming through the financial system. Note that we can interpret the high-powered money as including, not only required reserves at the central bank, but any compulsory investment in government securities at a controlled interest rate, or directed credit to programmes where the government would otherwise have to provide a subsidy, or simply to credit ceiling on the private sector which have the effect of increasing banks surplus funds which must be placed in the central bank. To the extent that an increase in h results from an increase in any such requirements ϕ , we may think of it as a crowding-out by the government of private sector borrowing.

A1.2 The steady state

In a steady state the ratios to real output is constant, leaving us with a steady state relation:

$$d = (g + \pi)\phi m(i^d - \pi). \quad (3)$$

Now we assume that capacity growth does depend on the private sector's access to credit. Unless the private sector can get enough credit, it will not be able to generate capacity growth at the maximum potential γ . We assume that, up to this ceiling or potential, output growth is proportional to credit.²⁵

$$g = \min \{ \alpha(1 - \phi)m(i^d - \pi), \gamma \}. \quad (4)$$

The combinations of π and ϕ that satisfy equations (3) and (4) can be plotted as in figure A1, drawn on the assumption that the interest rate i does not vary automatically with the inflation rate π . Equation (3) is the U-shaped curve labelled dd . We will ignore the "Laffer-curve" characteristic it displays at very high inflation rates and concentrate on the downward-sloping section. Equation (4) is labeled yy . It is downward sloping and shows combinations of π and ϕ which deliver sufficient credit to the private sector to attain the maximum potential growth.

²⁵This makes sense chiefly in the context of an endogenous growth model. For example, it could derive from an AK model of growth, with the change in the capital stock - and therefore the change in output - being proportional to credit.

Recalling that dd is a steady-state relationship, we see that a monetary authority faced with the requirement to finance a certain steady state deficit can do so with various combinations of inflation π and crowding-out ϕ . However, if it also wants to provide for the maximal output growth γ , it needs to choose the combination at which the relevant dd intersects $\gamma\gamma$. We can denote that combination as $(\pi(d), \phi(d))$. If the deficit is not too big, then the curves will cross and the maximal growth will be attainable.

But if the deficit is too high, then this cannot be done, either because there is no intersection, or because the intersection is at an infeasible reserve ratio $\phi > 1$. The government could choose the limit $\phi = 1$, and a high inflation rate. If the deficit is very low, maximal growth may be achieved for negative values of ϕ , implying the accumulation of assets by the government. These two limiting cases call to mind Zaire (Regime III) and Botswana (Regime I), respectively.

By choosing a particular (low) inflation rate, it may not be possible for the authorities to finance the deficit without crowding out private credit below that needed for maximal growth (cf. the Franc Zone).

Regimes IV and V are intermediate ones, with π and ϕ both available to achieve the maximal growth rate. If we allow interest rates to be freed to a market clearing level (again ignoring the possibility of equilibrium credit-rationing) we obtain two potential improvements. First, enhanced distribution of available private sector credit instead of possibly arbitrary rationing (not explicitly modeled), and second, an increase in the volume of intermediation for any given inflation rate π as the deposit rate increases.

This discussion highlights the fact that monetary financing of the deficit has an additional dimension to that of inflation. The apparent lesson is that the combination of a rigid adherence to price stability with an excessive government deficit may have damaging effects through crowding out of private credit. If the deficit is truly irreducible, a more flexible monetary regime might give a better outcome. Better still, the deficit should be adapted to what can be financed in a non-inflationary manner without crowding-out.

A1.3 Volatility

But perhaps emphasis on a single steady state loads the dice in favor of high inflation. Experience shows that high inflations are variable inflations, and if variable inflation is inimical to growth then this may be a reason for preferring a regime that generates stable inflation even at the cost of not always being at the intersection of dd and $\gamma\gamma$. We can see this if we are prepared to examine variances over different steady states. If the deficit-financing steady states is approached quite quickly, then this may not be an inadmissible way of proceeding.

Thus suppose that maximal output γ is negatively related to the variance of inflation. If the deficit is subject to random shocks ϵ

$$d = d^* + \epsilon,$$

with variance σ_ϵ^2 then a policy rule which always chooses $(\pi(d), \phi(d))$ at the intersection of dd and yy will induce a variance of π which, to a linear approximation, is proportional to σ_ϵ^2 . This will lower $\gamma(\sigma_\pi^2)$. It will therefore be preferable in general to reduce the response of π to ϵ . The optimal financing policy will be to choose a point on dd between $(\pi(d), \phi(d))$ and $(\pi(d^*), \phi(d^*))$, thereby stabilizing inflation. This may provide an additional rationale for Regime I being chosen by some countries.

Bibliography

- Adam, C. (1994), "On the Dynamic Specification of Money Demand in Kenya", *Journal of African Economies*.
- Agénor, P.-R. and N.U. Haque (1995), "Macroeconomic Management with Informal Financial Markets", *International Journal of Finance and Economics*, forthcoming.
- Agénor, P.-R. and P. Montiel (1995), *Development Macroeconomics* (Princeton: University Press).
- Aizenman, J. and N. Marion (1993), "Macroeconomic Uncertainty and Private Investment", *Economics Letters*, 41, 207-210.
- Aryeetey, E. and M. Hyuha (1991), "The Informal Financial Sector and Markets in Africa: An Empirical Study", in A.J. Chhibber and S. Fischer, eds., *Economic Reform in Sub-Saharan Africa*, (Washington, DC: The World Bank).
- Bernanke, B.S. and M. Gertler (1995), "Inside the Black Box: The Credit Channel of Monetary Policy Transmission", *Journal of Economic Perspectives*, 9, 27-45.
- Bertocchi, G. and F. Canova (1996), "Did Colonization matter for Growth? An Empirical Exploration into the Historical Causes of Africa's Underdevelopment", CEPR Discussion Paper 1444.
- Bevan, D., P. Collier and J.W. Gunning (1990), *Controlled Open Economies* (Oxford: Clarendon).
- Bruno, M. and S. Fischer (1990), "Seigniorage, Operating Rules and the High Inflation Trap", *Quarterly Journal of Economics*, 105, 353-374.
- Caprio, J.G., Jr. and P. Honohan (1993), "Excess Liquidity and Monetary Overhangs", *World Development*, 21, 4, 523-534.
- Chamley, C. and P. Honohan (1993), "Financial Repression and Bank Intermediation", *Savings and Development*, 17, 3, 301-308.
- Collier, P. (1991), "Africa's External Relations: 1960-90", *African Affairs*, 90, 339-56.
- Cukierman, A. (1992), *Central Bank Strategy, Credibility, and Independence*, (Cambridge, Mass: MIT Press).
- Cukierman, A., S. Webb and B. Neyapti (1992), "Measuring the Independence of Central Banks and its Effect on Policy Outcomes", *World Bank Economic Review*, 6, 353-398.

- Decaluwé B. and F. Nsengiyumwa (1994), "Policy Impact under Credit Rationing: A Real and Financial CGE Model of Rwanda", *Journal of African Economies*, 3.
- Domowitz, I and I. Elbadawi, (1987), "An Error-Correction Approach to Money Demand: The Case of Sudan", *Journal of Development Economics*; 26(2), 257-75.
- Duesenberry, J.D. and M. McPherson eds. (1992), *Monetary Management in Sub-Saharan Africa*, Harvard Institute for International Development.
- Easterly, W., C.A. Rodriguez and K. Schmidt-Hebbel eds. (1994), *Public Sector Deficits and Macroeconomic Performance* (Oxford University Press).
- Edwards, S. and M.S. Khan (1985), "Interest Rate Determination in Developing Countries: A Conceptual Framework", *IMF Staff Papers*, 32, 377-403.
- Flood, R.P. and A.K. Rose (1995), "Fixing Exchange Rates", *Journal of Monetary Economics*, 36, 3-39.
- Hanke, S. and K. Schuler (1994), *Currency Boards for Developing Countries: A Handbook*, (San Francisco, Ca., ICS Press).
- Honohan, P. (1992), "Price and Monetary Convergence in Currency Unions: The Franc and Rand Zones", *Journal of International Money and Finance*, 11, 397-410.
- Honohan, P. (1993), "Financial Sector Failures in Western Africa", *Journal of Modern African Studies*, 31, 1, 49-65.
- Honohan, P. (1994), "Inflation and the Demand for Money in Developing Countries", *World Development*, 22, 2, 215-23.
- Kiguel, M. and S.A. O'Connell (1995), "Parallel Exchange Rates in Developing Countries", *World Bank Research Observer*, 10, 1, 21-52.
- Kimei, C.S. (1996), "Financial Markets and the Operation of Monetary Policy in Africa: The Case of Tanzania", Paper prepared for the AERC project *Financial Markets and Monetary Policy: The African Experience*.
- King, R.G. and R. Levine (1993), "Finance and Growth: Schumpeter Might Be Right", *Quarterly Journal of Economics*, 108, 717-738.
- Montiel, P.J. (1995), "Financial Policies and Economic Growth, Theory, Evidence and Country-Specific Experience from Sub-Saharan Africa", AERC Special Paper 18.

- Montiel, P.J., P.-R. Agénor and N.U. Haque (1993), *Informal Markets in Developing Countries* (Oxford: Basil Blackwell).
- Mwega, F.M. and T. Killick (1990), "Monetary Policy in Kenya, 1967-88", *Eastern Africa Economic Review*, 6, 117-42.
- O'Connell, S.A. (1995), "Monetary Adjustment and Policy Compatibility in a Controlled Open Economy", *Journal of African Economies*, 4, 1, 52-82.
- Owoye, O. and O.A. Onafowora (1994), "The Relative Importance of Monetary and Fiscal Policies in Selected African Countries", *Applied Economics*, 26(11), 1083-91.
- Pereira da Silva, L.A. and A. Solimano (1994), "The Transition and the Political Economy of African Socialist Countries at War (Angola and Mozambique), The World Bank, *mimeo*.
- Pill, H. and M. Pradhan (1995), "Financial Indicators and Financial Change in Africa and Asia", International Monetary Fund Working Paper WP/95/123.
- Sowa, N.K. (1996), "Financial Markets and Monetary Policy: Ghana", Paper prepared for the AERC project *Financial Markets and Monetary Policy: The African Experience*.
- Younger, S.D. (1992), "Testing the Link Between Devaluation and Inflation", *Journal of African Economies*, 2.