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Financial Indicators and Financial Change in Africa and Asia

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Authorized for distribution by David T. Coe

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Abstract

Deregulation of the financial system often proceeds in tandem with macroeconomic stabilization centered on monetary and other financial targets. This paper presents a model where there may be conflict between these processes. The indicator properties of some financial variables may be rendered unstable by the liberalization process. However, other, carefully selected financial aggregates may contain information about economic activity that is useful to policy makers during stabilization. Data from a group of selected African and Asian countries is examined. These are broadly consistent with the predictions of the model, while highlighting the importance of macroeconomic and financial stability for the success of financial reforms.

JEL Classification Numbers

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### Summary

In many developing countries, macroeconomic stabilization and supply side reform are implemented simultaneously, but the two processes may conflict. An important component of structural reforms is the liberalization of financial markets--primarily interest rate deregulation, the abolition of credit ceilings, and the removal of administrative controls on the capital account of the balance of payments. Although there is widespread consensus on the benefits of such policies, little attention has been paid to the implications of financial liberalization for the behavior of financial variables, particularly the monetary and credit aggregates commonly used as intermediate targets during macroeconomic stabilization or as indicators of the success of financial reforms.

This paper outlines a simple two-stage model of financial liberalization in the developing country context--first, the removal of administrative controls on domestic interest rates, and second, the removal of controls on cross-border capital flows. The model suggests that deregulation *does* change the relationship between financial variables and economic activity. In particular, conventional measures of "financial deepening," such as the level of real interest rates and the ratio of broad money to GDP, may give misleading signals about the success of reform and its implications for real activity. Existing analyses have neglected important issues relating to the openness of the capital account of the balance of payments, the extent of public borrowing from the domestic financial system, the development of non-bank financial intermediation, and the competitiveness of the banking sector. The framework presented here addresses some of these issues. The theoretical analysis suggests that a wide, private sector credit aggregate is the preferred financial indicator during periods of ongoing financial liberalization.

The empirical section of the paper appraises financial liberalization programs in a selected group of African and Asian countries and assesses the success of financial reforms in stimulating growth in the financial sector. In the Asian countries, where financial liberalization has created a well-behaved, commercial banking sector, financial deepening has been extensive. There is also weak evidence that credit extended to the private sector is the preferred financial indicator of real activity, especially when the capital account of the balance of payments is open. In contrast, financial liberalization in Africa has failed to develop the financial sector and the behavior of financial indicators remains erratic, offering little guide to real economic activity. Nevertheless, careful interpretation of the data is required because different measures of financial development can give different signals about the success of reform. All these results are consistent with the model presented in this paper.

## I. Introduction

In many developing countries, macroeconomic stabilization and supply side reform are implemented simultaneously. Typically, the liberalization of financial markets--including interest rate deregulation, the abolition of credit ceilings, and the removal of administrative controls on the capital account of the balance of payments--is an important component of structural reform. There is widespread consensus on the benefits of such policies both in the theoretical literature and from experience. Market determined interest rates may lead to a better allocation of domestic saving while inflows of foreign capital augment domestic resources, permitting greater and more efficient investment.

However, little attention has been paid to the implications of financial liberalization for the behavior of financial variables, particularly the monetary and credit aggregates, that are commonly used as intermediate targets and indicators of the success of financial reform during macroeconomic stabilization.

This paper outlines a simple two stage model of financial liberalization in the developing country context. The model suggests deregulation does change the relationship between financial variables and economic activity. Nevertheless, carefully chosen variables may retain useful indicator properties.

This simple analytical framework is confronted with data from selected African and Asian countries. Of course, the process of liberalization in Asian countries is more advanced. The implementation of financial reforms in Africa only began in earnest in the late 1980s, whereas Asian liberalization was instituted in the late 1970s. Nevertheless, as summarized by Chart 1, the post-liberalization experience of African and Asian nations differs considerably, notably along two dimensions. First, financial deepening following interest rate deregulation was extensive in Asia but has yet to occur in Africa, especially on the private sector credit measure.<sup>1</sup> Second, the behavior of money and credit through time are similar in the Asian countries, but appear to be divergent in Africa following financial liberalization in the early 1990s. The paper suggests a number of explanations for these phenomena, highlighting their likely implications for economic activity and development.

## II. A Simple Structural Framework

As a starting point for the analysis of financial liberalization in developing countries, a simple analytical framework is introduced. This

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<sup>1</sup>Of course, financial deepening will itself depend on the state of development of the economy as a whole. The more advanced general development of the private sector in Asia will have helped to promote financial deepening beyond that observed in Africa, where the private sector remains underdeveloped and weak.

exploits McKinnon's (1973) Fisherian model of "lumpy" investment, as extended by Krugman (1979), and McKinnon and Pill (1996).

The domestic economy consists of a large number ( $N$ )<sup>1</sup> of atomistic individual firm-households--hereafter simply "firms"--a government, and a financial system consisting (at a minimum) of a central bank and a competitive commercial banking sector. Each household lives for two periods and is then replaced by an identical household. For simplicity, there are no over-lapping generations. The government is infinitely lived, spanning all generations.

The economy produces a single composite good which may be traded with the rest of the world. Every generation, each household receives an endowment  $m$  of this good at the beginning of the first period. The preferences of individual households over consumption across the two periods are described by a utility function  $U(c_1, c_2)$ . Since there is only a single good, it is plausible to assume that this function is homothetic. Households maximize utility with respect to the wealth they derive from their endowment and the available technology, taking prices as given.<sup>2</sup>

Firm-households are free to choose between two production technologies: a traditional production technique  $F(\cdot)$  with decreasing returns to scale and a modern production process  $G(\cdot)$  which exhibits increasing returns over some range and requires a large initial fixed investment  $H$ .<sup>3</sup> The latter technique is potentially more productive, but the indivisibility in the production technology requires households to borrow so as to maintain positive consumption in the first period. Consequently, credit plays an important role in stimulating real activity through over-coming technological indivisibilities.

We make a very simple extension to the McKinnon (1973) framework so as to encompass the public sector. Government decisions are exogenous. For simplicity, we assume government activity is unproductive.<sup>4</sup> The government's primary fiscal deficit ( $G - T$ ) is financed either by borrowing from the central bank, which results in the creation of base money ( $M$ )--"printing money"--or by borrowing from domestic financial markets ( $DLG$ ) or from abroad ( $FLG$ ). The financial behavior of the public sector is summarized by the following expression:

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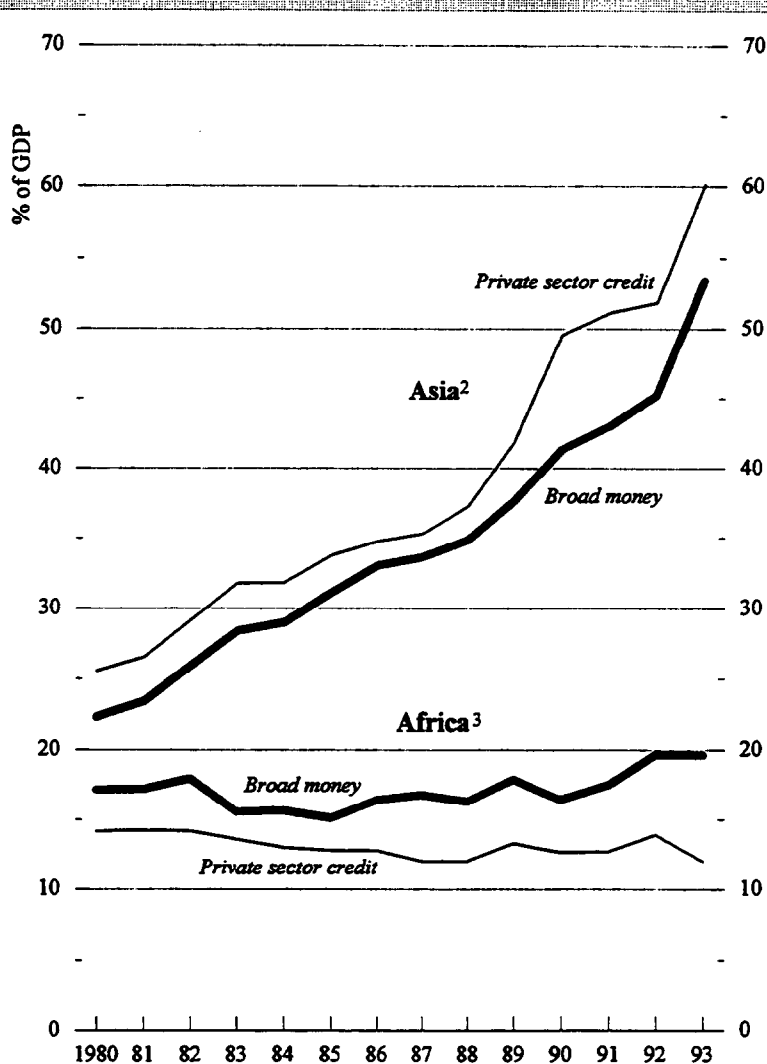
<sup>1</sup>We assume  $N$  is sufficiently large for integer problems not to be a concern.

<sup>2</sup>In this simple two period, single composite-good model, the only price is the real interest rate--the relative price of consumption in the two periods.

<sup>3</sup>Increasing returns to scale are defined here as a declining average cost of production. Diagrams 1 to 3 assume marginal costs are also declining over some range; this, however, is not strictly necessary for the arguments made in this paper.

<sup>4</sup>In other words, government spending does not contribute to real activity.

**Chart 1. Selected African and Asian Countries:  
Indicators of Financial Deepening<sup>1</sup>**



<sup>1</sup>All aggregates are constructed using 1987 GDP weights.

<sup>2</sup>Indonesia, Korea, Malaysia, Philippines, Sri Lanka, and Thailand. Data for 1993 exclude Indonesia.

<sup>3</sup>The Gambia, Ghana, Kenya, Madagascar, Malawi, and Zambia.



$$(G - T) = \Delta M + \Delta DLG + \Delta FLG \quad (1)$$

Since the government is assumed to be infinitely lived, it does not have to obey the two period budget constraint faced by private firm-households. Debt outstanding at the end of one generation can simply be rolled over to the next. The government chooses to finance  $q_1$  of its deficit by borrowing from the central bank and  $q_2$  from domestic financial markets, leaving  $(1-q_1-q_2)$  to be borrowed from abroad. Consequently, we can write:

$$\Delta M = q_1 (G - T) \quad (2)$$

$$\Delta DLG = q_2 (G - T) \quad (3)$$

$$\Delta FLG = (1 - q_1 - q_2) (G - T) \quad (4)$$

We call the exogenous policy decision over  $q_1$  and  $q_2$ , the choice of a government financing rule. Implicit in the above discussion is an assumption that the central bank is not independent of the government and will monetize the public debt as instructed.

In many developing countries, a large proportion of financial intermediation is undertaken by the central bank, an issue we turn to in the empirical section. We choose to draw a sharp distinction between the central bank and private deposit-taking banks because the former often extend soft loans to state-owned enterprises. The value of these loans should be accounted for as government spending financed by the creation of high-powered, outside money, a very different process from lending by commercial banks financed from inside money. Although this approach is consistent with economic principles, it is not that adopted in most countries' national accounts.<sup>1</sup>

In contrast to public sector decisions, the behavior of the private financial system is endogenous. For simplicity, we initially assume that problems of information, monitoring and enforcement preclude the emergence of securities' markets. This follows McKinnon's (1973, 1993) discussion of developing countries, where the private financial system is identified with the domestic commercial banking sector. Although descriptively accurate in many cases, this assumption is obviously restrictive. The implications of relaxing it are considered in Section IV. The balance sheet of the commercial banking system is summarized as:

$$L + DLG = D + EXT \quad (5)$$

where  $L$  is bank credit extended to the domestic non-bank private sector,  $D$  is domestic residents' deposits at indigenous commercial banks

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<sup>1</sup>For an attempt to measure the "hidden fiscal deficit" in China, caused by central bank financing of state-owned enterprises, see Wong et al. (1993).

(definitionally equivalent to broad money) and **EXT** is net foreign owned deposits.

Although the financial system is central to the structural model presented here, its behavior is assumed to be relatively passive. In a world of perfect certainty--which this model implicitly assumes--financial intermediaries are little more than conduits through which savings are channelled into productive investments. Money (and other financial variables) are merely a "veil" behind which real economic activity is conducted. Banks simply pool and distribute savings in an impersonal market avoiding the transactions costs associated with uncoordinated attempts to identify and exploit a "double coincidence of wants" between potential borrowers and lenders. Only when uncertainty is introduced can the behavior of the financial system itself become important. Although the implications of uncertainty and the policy interventions it may provoke are likely to be profound at both macroeconomic [McKinnon and Pill (1996)] and microeconomic [Stiglitz and Weiss (1981)] levels, we do not address them in this paper.

The country we model is a small open economy that can import or export the composite good in potentially infinite amounts at the prevailing world price. Moreover, when administrative controls permit, domestic residents are able to borrow or deposit funds in the perfectly elastic international capital market at a constant world interest rate  $r^*$ .

Exploiting the simple Fisherian two period framework generates two significant practical advantages. First, the optimization problem facing each firm-household can be split into two distinct parts: an investment decision aimed at maximizing firm wealth (value) subject to technological constraints and the real interest rate; and a consumption decision aimed at maximizing utility for given wealth and the same real interest rate.

*investment problem:*

$$\max_{x_1, x_2} W = x_1 + \frac{x_2}{(1+r)} \quad \text{subject to } x_2 \leq \max (f(x_1), g(x_1)) \quad (6)$$

where  $(x_1, f(x_1))$  is the locus of points corresponding to the production possibility frontier (PPF) for firms exploiting the traditional technology  $F(\cdot)$ , and  $(x_1, g(x_1))$  is the PPF for those firms adopting the modern technique  $G(\cdot)$ .

*consumption problem:*

$$\max_{c_1, c_2} U(c_1, c_2) \quad \text{subject to } c_1 + \frac{c_2}{(1+r)} \leq W \quad (7)$$

Perhaps more importantly, the Fisherian framework is amenable to solution using simple geometric methods which are described below (Diagrams 1 through 3).

### 1. Three Phases of Financial Liberalization

This section outlines the effects of financial liberalization on the behavior of financial indicators in the economy described above. Following earlier work [Pill (1993), McKinnon and Pill (1996)], we distinguish three phases of a financial liberalization program. At the outset--a state we denote the *financially repressed economy* (FRE)--the domestic financial system is moribund. Usury laws and other restrictions on interest rates charged or offered by the banking system make financial intermediation unprofitable; domestic residents are unable to place their savings with indigenous deposit taking banks, instead being forced to make real investments in the low productivity technology.<sup>1</sup> No external finance is available to firms. In the absence of a domestic capital market, the government is forced to resort to foreign borrowing (with current account implications) or the central bank "printing press" to finance any primary fiscal deficit ( $q_2$  is constrained to zero).

In the initial round of economic reform, culminating in the creation of the *domestically liberalized economy* (DLE), the authorities abolish interest rate and other direct controls on the commercial banking sector, allowing a domestic financial system to emerge. Banks are able to intermediate funds between domestic savers and firms wishing to borrow so as to adopt the modern production process. However, the domestic private sector remains isolated from the international capital market because administrative controls on the capital account of the balance of payments are retained. Nevertheless, *individual* firms now have access to a functioning domestic capital market: they can borrow, are no longer constrained to self-finance and, by implication, may adopt the modern technology. The government has continued access to foreign borrowing. Moreover, the emergence of a domestic capital market relaxes the government financing constraint on  $q_2$ : the government may borrow domestically from commercial banks in addition to the central bank.

In the final stage of liberalization, capital controls are abolished, allowing domestic residents to participate freely in the perfectly elastic international capital market through domestic bank intermediaries. We denote this final state the *internationally liberalized economy* (ILE).

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<sup>1</sup>One interpretation of the low productivity, traditional technique is a simple storage technology. When the financial system is moribund or repressed, individuals save in the form of excess inventory holdings of durable and intermediate goods. Such behavior is extensive in financially repressed, predominantly agricultural economies.

This characterization of financial liberalization corresponds, albeit in a stylized way, to the "optimal" order of economic liberalization advocated by McKinnon (1982, 1993) amongst others. During the initial phase--corresponding to the transition from FRE to DLE--domestic controls on interest rates are removed allowing market clearing rates to be established. Capital account restrictions are only abolished in the final stages of the liberalization program.

To solve the simple Fisherian model in each of these policy environments, we use a 'perfect competition' equilibrium concept, where banks are efficient conduits for private savings. In practice, especially in developing countries, inefficiencies are likely to remain even after liberalization--a point emphasized in the discussion of the data in Section V below. After solving the model, we examine the behavior of various financial aggregates in Section III, especially the extent to which they reflect movements in real activity.

a. The Financially Repressed Economy (FRE)

In the absence of an efficient capital market, individual firm-households must self-finance all productive investment. They are reliant on their initial endowment as a source of investment funds and are constrained by the existence of technological indivisibilities in the modern production process. In Diagram 1, the optimum consumption/investment pattern is shown at  $C_{FRE} = Q_{FRE}$ , the point of tangency between an indifference curve and the traditional technology. The implicit real interest rate<sup>1</sup> is low, reflecting the low marginal productivity of real investments in traditional technology.

With no banking system, broad money and bank lending are both necessarily zero. They cannot be used as indicators simply because they do not exist. One further implication of this is that borrowing from domestic financial markets ( $q_2$ ) is constrained to zero. Narrow money expands to cover that portion of the fiscal deficit that is not financed by foreign borrowing.

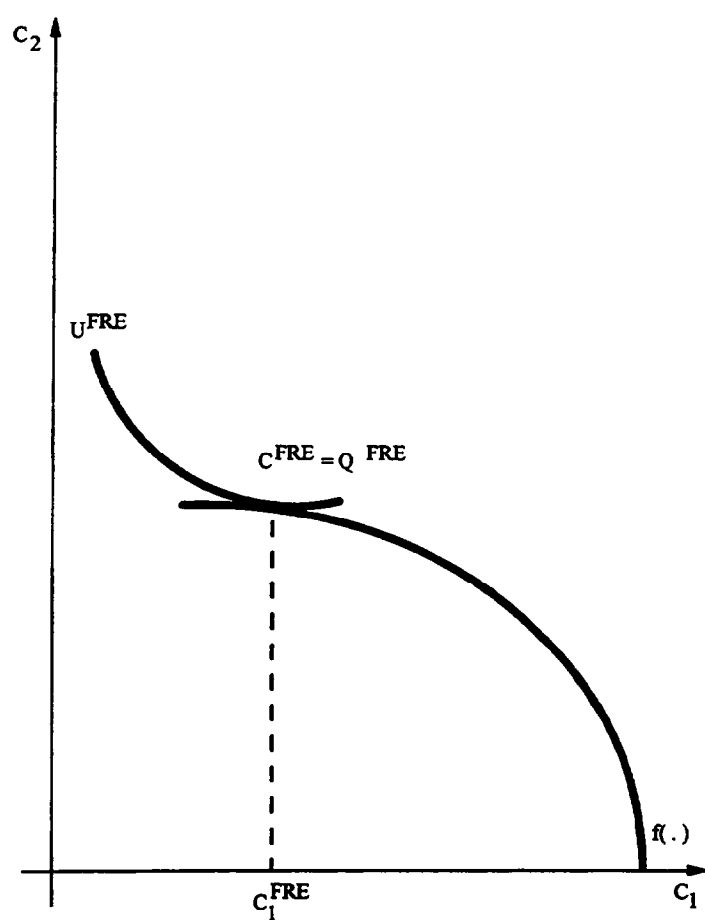
$$M^{FRE} = M_{(t-1)} + q_1^{FRE} (G - T)^{FRE} \quad (8)$$

Here, and throughout the paper, we use the term 'narrow money' synonymously with high powered or outside money. That is, narrow money consists solely of the monetary liabilities of the central bank (and excludes demand deposits held at commercial banks).

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<sup>1</sup>Measured by the slope of the production possibility schedule at the point of tangency, i.e., at the rate at which current consumption is transformed into future consumption.

Diagram 1. Financially Repressed Economy (FRE)





b. The Domestically Liberalized Economy (DLE)

Following the initial phase of reform, banks are able to intermediate funds between those domestic firm-households that continue to employ traditional production techniques (and are now saving in the form of bank deposits rather than accumulating low productivity real capital) and those that decide to adopt the modern technology. By borrowing from banks, the latter group are able to overcome the technological indivisibility, making the required initial investment while still maintaining positive first period consumption.

Since all firm-households are identical, all must achieve the same level of utility in equilibrium [Krugman (1979)]. Otherwise firms would have an incentive to switch between production technologies, which would be inconsistent with static competitive equilibrium. With identical preferences, this implies that firm-households face the same opportunity sets, as defined by the inter-temporal budget constraint. Because there are firms employing each of the two production techniques, the budget constraint must simultaneously be tangent to both production schedules (see Diagram 2). This completely determines the slope of the budget constraint. In equilibrium, the real interest rate  $r^{DLE}$  (which, using conventional Fisherian analysis, is related to the slope of the budget constraint) is entirely determined by technological factors, specifically the gap in average productivity between the two production processes. Nevertheless, the marginal returns to each production technology<sup>1</sup> are identical (by construction), giving revenue maximizing firms no incentive to switch to the alternative technique.

With the real interest rate so determined, all individuals will choose to consume at  $C^{DLE}$ . Since substitution and income effects will off-set one another (under the weak assumption that consumption in both periods is a normal good), first period consumption may go up or down relative to that observed in the FRE. We make the intuitively appealing assumption that it rises. Average consumption over the two periods will almost certainly rise and welfare unambiguously does so. As shown in Diagram 2, firms using traditional techniques produce at  $Q_t^{DLE}$ : having consumed  $c_1^{DLE}$ , they invest  $(m - x_1^t)$  in the traditional technique and place the remainder of their endowment  $(x_1^t - c_1^{DLE})$  on deposit with commercial banks. Similarly, firms adopting the modern technology choose to produce at  $Q_m^{DLE}$ . Consuming at  $c_1^{DLE}$  and investing  $(m - x_1^m) > H$  in the increasing returns production technology implies they must borrow  $(c_1^{DLE} - x_1^m)$  from the banking system.

Since the real interest rate is determined by technological factors, it cannot vary to clear the capital market. Variations in the number of firm-households adopting modern ( $N_m$ ) and traditional ( $N_t$ ) technologies are the

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<sup>1</sup>Represented by the slope of the production possibility frontier at the point of tangency defining firms' optimal investment choices at  $Q_t^{DLE}$  and  $Q_m^{DLE}$  for the traditional and modern technology respectively.

market clearing mechanism. Aggregate private sector borrowing ( $L$ ) is thus  $N_m(c_1^{DLE} - x_1^m)$  and private sector bank deposits ( $D$ ) are  $N_t(x_1^t - c_1^{DLE})$ .

The government financing rule is no longer constrained to  $q_2 = 0$ . The government is also able to borrow from the pool of domestic deposits through the domestic financial system. Public borrowing crowds out private borrowing, reducing the number of firms that are able to adopt the modern technology. Exogenous choices over the government financing rule and fiscal deficit continue to determine narrow money growth. Substitution into the balance sheet identities yields:

$$N_m(c_1^{DLE} - x_1^m) + DLG = N_t(x_1^t - c_1^{DLE}) \quad (9)$$

$$M^{DLE} = M^{FRE} + q_1^{DLE}(G - T)^{DLE} \quad (10)$$

### c. Internationally Liberalized Economy

In the final phase of the liberalization process, domestic banks are free to accept deposits from the perfectly elastic international capital market. In equilibrium, the domestic real interest rate must equal the world real interest rate. All firm-households borrow ( $c_1^{ILE} - x_1^{ILE}$ ) to adopt the modern production technique at  $Q^{ILE}$  using foreign saving intermediated through the banking system (see Diagram 3). With income and substitution effects reinforcing one another, first period consumption in the ILE is unambiguously greater than that in the DLE. Moreover, real activity averaged over the two periods, and welfare, also rise unambiguously.

Because banks can raise deposits from overseas to fund their lending activity, no domestic deposits are accepted--broad money falls to zero.<sup>1</sup> By implication, the government financing rule is again constrained to  $q_2=0$ . As in the previous regimes, narrow money is exogenously determined by the authorities' funding and fiscal decisions.

The counterpart to the capital inflow needed to finance domestic borrowing is a current account deficit on the balance of payments in the first period. If  $q_1$  is less than unity, this will be augmented by government borrowing from abroad. However, sustainability of the private component of the balance of payments is ensured by a second period trade surplus--the returns from investment in modern technology are sufficient to repay foreign creditors.

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<sup>1</sup>Of course, this extreme result is unrealistic, arising out of the necessary abstractions required to formulate a tractable model. In practice, even in economies with open capital accounts, a large proportion of investment is financed by domestic saving (Goldstein and Mussa (1994)). An extension of this model which introduces a distinction between tradable and non-tradeable goods [Pill (1995)] does give rise to a role for domestic saving in financing investment.

Diagram 2. Domestically Liberalized Economy (DLE)

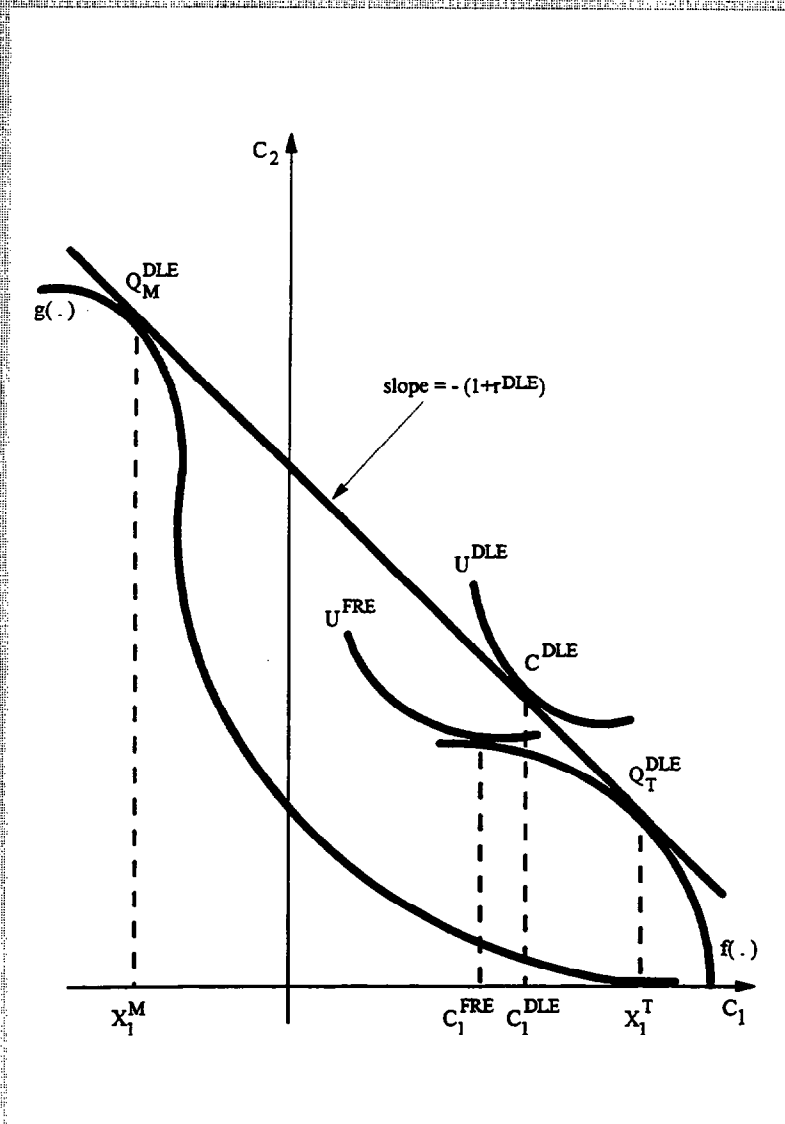
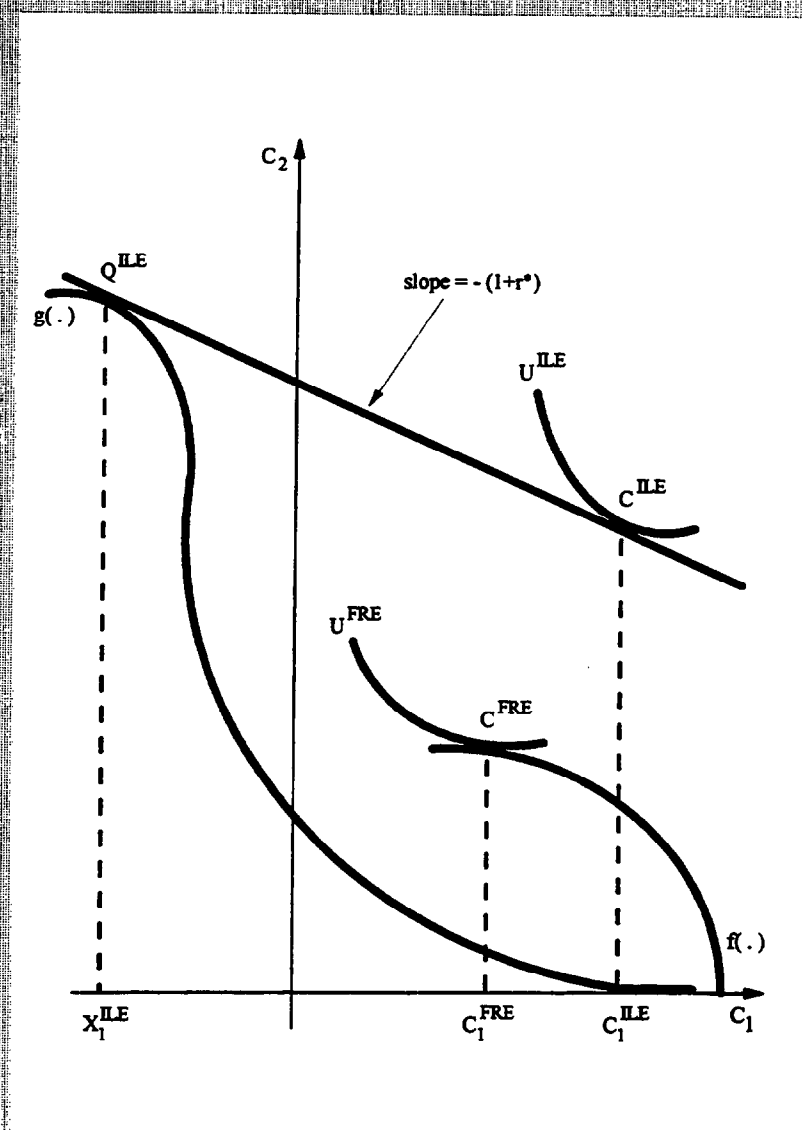


Diagram 3. Internationally Liberalized Economy (ILE)



### III. Financial Indicators in the Three Phase Framework

We now consider the properties of a number of financial indicators in this simple three phase framework for financial liberalization. Consideration is limited to broad money, narrow money, bank credit, and real interest rates.<sup>1</sup> All of these indicators have been advocated as intermediate targets or indicators for policy purposes during stabilization periods.

Table 1 summarizes the equilibrium levels of financial variables in our simple model for each of the policy environments. Table 2 summarizes the indicator properties of these financial variables for real activity at each stage of the liberalization process.

The evolution of narrow money is exogenously determined by the authorities' choices over government fiscal and financing policy. Narrow money may be a good indicator in some instances, tracking movements in real activity across the three stages of liberalization, but such an outcome would be merely coincidental. The indicator performance of narrow money for real activity is entirely dependent on the policy choices of the government and central bank. It contains only information regarding the prevailing fiscal position and government financing rule--since these are exogenous policy choices of the authorities such information is already known to policymakers.<sup>2</sup> Of course, narrow money targets may offer a useful tool for constraining government fiscal policy choices and improving government financing techniques. Poor fiscal management has often led to unsustainably high levels of price inflation. However, narrow money is not a useful indicator of real activity or the success of financial sector structural reform in this framework.

In the DLE, the level of bank credit is also affected by the choice of government financing and fiscal policy. Greater borrowing by the government from indigenous banks crowds out lending to the domestic private sector and reduces the number of firm-households that are able to exploit the modern technology. Nevertheless, in contrast to narrow money, this is not a damning problem for the indicator properties of credit. If government borrowing from domestic banks does not crowd out investment in modern technology entirely, welfare and activity still rise to their DLE

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<sup>1</sup>We exclude a formal analysis of the indicator properties of the Divisia monetary aggregate which, in principle, measures the transactions services offered by monetary asset holdings. We have argued elsewhere (Pill and Pradhan (1994)) that this sophisticated measure is only appropriate under the--often implicit--assumption of a transactions model of money. Once that model is abandoned, as in the structural framework presented here, the Divisia index is unlikely to exhibit superior indicator properties.

<sup>2</sup>Divisia indices, in which narrow money is a heavily weighted component, are subject to similar problems.

Table 1. Financial Indicators in the Three-Phase Framework

| Stage                                | Financially Repressed<br>Economy (FRE) | Domestically Liberalized<br>Economy (DLE) | Internationally<br>Liberalized Economy (ILE) |
|--------------------------------------|--|---|--|
| Credit to domestic<br>private sector | 0                                      | $N_m (c_1^{DLE} \cdot x_1^m)$             | $N (c_1^{ILE} \cdot x_1^{ILE})$              |
| Broad money                          | 0                                      | $N_t (x_1^t \cdot c_1^{DLE})$             | 0  |
| Narrow money                         | $q_1^{FRE(G-T)} FRE$                   | $M^{FRE+q_1^{DLE(G-T)}} DLE$              | $M^{DLE+q_1^{ILE(G-T)}} ILE$                 |
| Real interest rates                  | $r^{FRE}$                              | $r^{DLE}$                                 | $r^*$  |

Table 2. Rankings of Welfare, Real Activity and Financial Variables

| Stage                                     | Welfare | Average Activity | First Period Activity | nbps Credit <sup>1</sup> | Broad Money | Narrow Money | Real Interest Rates |
|---|---------|------------------|-----------------------|--------------------------|-------------|--------------|---------------------|
| <u>Levels</u>                             |         |                  |                       |                          |             |              |                     |
| Financially Repressed Economy (FRE)       | 3       | 3?               | 3??                   | 3                        | 2=          | ?            | 3                   |
| Domestically Liberalized Economy (DLE)    | 2       | 2?               | 2??                   | 2                        | 1           | ?            | 1                   |
| Internationally Liberalized Economy (ILE) | 1       | 1                | 1                     | 1                        | 2=          | ?            | 2                   |
| <u>Transition stage</u>                   |         |                  |                       |                          |             |              |                     |
| Financially Repressed Economy (FRE)       |         |                  |                       |                          |             |              |                     |
| to  | +       | +                | +                     | +                        | +           | ?            | +                   |
| Domestically Liberalized Economy (DLE)    |         |                  |                       |                          |             |              |                     |
| to  | +       | +                | +                     | +                        | -           | ?            | -                   |
| Internationally Liberalized Economy (ILE) |         |                  |                       |                          |             |              |                     |

Note: Question marks indicate situations where some ambiguity remains in the ranking because of off-setting income and substitution effects. The rankings shown follow intuition, as discussed in the main text.

<sup>1</sup>Non-bank private sector.

equilibrium levels regardless of how many firms adopt the modern technique.<sup>1</sup> As shown in Tables 1 and 2, if  $N_m > 0$  the direction of movements in credit between policy regimes continues to offer the correct signals about real economic developments. Moreover, the aggregate level of credit extended to the private sector in the DLE indicates how many firms adopt the technology. To the extent that investments in the traditional production technique are associated with non-market activities,<sup>2</sup> the level of credit may still correlate with official statistical measures of aggregate real activity.

In contrast, both broad money and real interest rates clearly fail to rank the three stages of financial liberalization correctly by either real activity or welfare. In the FRE and ILE, domestic deposits are zero, although these regimes represent the opposite extremes for real activity in our simple theoretical framework. Similarly, real interest rates peak in the DLE, falling to world levels as the economy is integrated into the international capital market. In contrast, activity increases on the transition from DLE to ILE.

These results tend to undermine a large empirical literature which purports to evaluate the importance of the financial system and financial liberalization to economic development and growth performance. Typically, financial variables are regressed against per capita GDP growth in large cross-country data sets. Explanatory variables often include real interest rates [Gelb (1989)] and "financial depth", measured as the ratio of broad money to nominal GDP [Fry (1994), King and Levine (1992)]. The results of such exercises have been, at best, mixed. The model presented here offers a potential explanation, although by no means one which is either comprehensive or unique (for alternatives, see Murdoch and Stiglitz (1993) and Fry (1995)). The existing literature ignores the role of government borrowing, the capital account, and international capital flows in the financial system. This paper's simple framework suggests that government financing decisions and capital inflows may introduce non-monotonicities into the relationship between economic activity and certain financial variables, notably broad money.

The Fisherian model also helps illustrate two inter-connected points. First, although the financial system may be important, it is not true that all financial variables will be good indicators of real economic developments whilst supply side reform of the financial system is being

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<sup>1</sup>That is, higher government borrowing does not affect the level of private sector real activity or welfare at the margin. It merely affects the composition of private activity between modern and traditional techniques. We do not dwell on this rather artificial result which arises out of the simple structure of the model.

<sup>2</sup>For example, the storage technology interpretation of the traditional production process. Warehousing grain would not add to measured second period output in the same manner as the harvest of grain from that planted at the end of period one.

implemented. Many will be affected by financial liberalization such that the signals they offer are hard to interpret--an example of the Goodhart's Law variant of the Lucas Critique [Lucas (1976)] (see Goodhart (1989) for a discussion of this phenomenon in the industrialized country context). Second, even in the face of on-going financial liberalization, some financial variables will retain good indicator properties because they are closely related to the "deep" behavioral structure of economic activity. Such variables are likely to be less vulnerable to Lucas-Critique instability in the face of exogenous changes in the policy environment. They may continue to constitute sensible intermediate targets for the implementation and presentation of the monetary policy component of macroeconomic stabilization as financial liberalization proceeds. In this paper, credit plays the central role, allowing individual firm-households to overcome indivisibilities in modern technology. Given this close association with real outcomes, it is unsurprising that credit is the preferred indicator in our structural framework.

#### IV. Financial Innovation in the Three Stage Framework

Thus far, we have assessed the effects of changes in the regulatory regime on the performance of financial indicators taking the behavior of the financial sector as that of a mere conduit or passive intermediary. However, another aspect of the overall process of financial change is innovation undertaken within the financial system itself. One important manifestation of this is the emergence of financial flows off the balance sheets of the commercial banking sector. Whilst a portion of such flows may be genuine off-balance sheet activities of the banks, the larger part is likely to result from the establishment of securities' markets and non-bank financial intermediaries. If the assumption that the domestic financial system is synonymous with commercial banks is relaxed and firm-households obtain access to alternative sources of external finance--bond, equity, and commercial paper markets--bank credit may no longer prove a good indicator for the real economy because substitution between various forms of credit is not internalized within the bank lending aggregate.

We encompass this possibility in our simple framework as follows. The commercial banking sector constitutes a share  $z$  of the domestic financial system as a whole. We replace equation (5) with the following expression for the entire financial system:

$$DPSC + DLG = GDFA + NFA \quad (11)$$

where DPSC is total borrowing by the domestic non-financial private sector, GDFA is gross domestic private sector financial assets and NFA is the net financial assets of overseas residents held in the domestic financial sector.

The banking sector's balance sheet accounts for a share ( $z$ ) of these aggregate stocks, implying:

$$z \text{ (DPSC + DLG)} = L - \text{LNBFS} + \text{PSC} \quad (12)$$

$$z \text{ (GDFA + NFA)} = D - \text{DNBFS} + \text{EXT} \quad (13)$$

where PSC is the public sector counterpart to broad money (i.e., government borrowing from the commercial banking system), LNBFS is bank lending to the non-bank domestic financial system and DNBFS is deposits received from the domestic non-bank financial system.

If  $z$  is constant throughout the liberalization program, bank credit may continue to offer the correct signals about real economic developments. However, it is likely that progressive liberalization may itself stimulate the emergence of alternative sources of funds to the domestic banking system, imparting a tendency for  $z$  to fall as financial deregulation progresses. This would tend to undermine the usefulness of bank lending to the domestic private sector as an indicator of real activity.

Moreover, since bank lending in this framework is a gross concept, any lending by the banking system to other sectors of the domestic financial system--although it must be offset by corresponding deposits--would increase  $L$  without adding to real activity, which in turn depends on aggregate lending to the domestic non-bank sector. For example, if one securities firm makes a deposit with a commercial bank and another takes out a loan, bank credit increases although no extra credit has been made available to productive firms to exploit the modern technology.

These problems arise because the simple bank lending measure fails to internalize substitution between bank and alternative sources of finance. They can be avoided by monitoring the broader credit aggregate DPSC which does internalize these effects. If such an aggregate is to be constructed from its bank and non-bank component data, care must be taken to net out lending between banks and other financial institutions to avoid double counting.

If product innovation by the financial system introduces an array of new credit instruments, a broad credit aggregate--including all sources of credit for the domestic non-financial private sector--is the preferred financial indicator.

## V. Financial Liberalization in Selected African and Asian Countries

The experiences of Asian countries pursuing financial liberalization have been studied extensively in previous work [Tseng and Corker (1991), McKinnon (1993), Ito and Krueger (1996)]. In contrast, work on Africa has been sparse: in adding to that literature, this paper draws on two notable previous contributions, by Turtleboom (1991) and Hadjimichael et al. (1995). This section summarizes the institutional reforms and financial liberalizations that have taken place in a number of selected African and

Asian countries.<sup>1</sup> For each country, the reform process is mapped into the simple three-stage framework for financial liberalization outlined above. This offers a coherent framework for comparison of the African and Asian experiences and some empirical analysis where data are available.

During the 1980s, a number of Asian countries liberalized their domestic financial systems, through a combination of interest rate deregulation and abolition of administrative controls on credit expansion and allocation. In some cases, further relaxation of controls has permitted the establishment and expansion of securities' markets and other non-bank sources of credit. Moreover, in many countries, the process of domestic deregulation has been accompanied or followed by a relaxation of capital controls on the balance of payments. Table 3 describes this process for a selected group of Asian countries. Although the length of each stage of liberalization varies considerably across countries and, in some cases, the on-going process of deregulation is far from complete, each program follows, in a stylized manner, the simple model of financial liberalization outlined in Section III (see Table 4).

Naturally, the correspondence between this simple analytical framework and reality is imperfect. Often the deregulation of interest rates has proceeded gradually, evidence of the authorities caution in implementing reform. Moreover, in some cases, the process of liberalization has paused and even been temporarily reversed. For example, Korea in 1965-66 and Malaysia temporarily in 1993-94 reimposed capital controls on the balance of payments in the face of large inflows of foreign financial capital that created difficulties for domestic monetary control (McKinnon (1993, chapter 10) and McKinnon & Pill (1996)).

The implementation of financial liberalization in Africa is more recent. Table 5 describes the relaxation and abolition of controls in a selected group of African countries and Table 6 maps the liberalization into the three-stage framework discussed above. Liberalization of domestic financial systems through the removal of interest rate controls and abolition of credit ceilings and directed credit programs only began in earnest in the late 1980s. Despite abolition of formal controls, continued government interference in the operation of financial institutions and markets through moral suasion and similar informal devices appears extensive--a result of ongoing public ownership of parts of the banking sector and lack of competition amongst privately owned banks [Turtleboom (1991)]. Liberalization of capital controls is yet more recent, and any analysis of African ILEs is hindered by the short post-external liberalization data samples.

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<sup>1</sup>The Asian countries selected are Indonesia, Korea, Malaysia, the Philippines, Sri Lanka, and Thailand; the African countries are Ghana, the Gambia, Madagascar, Malawi, Kenya, and Zambia. The choice of countries was, in part, constrained by data availability.

Table 3. Financial Liberalization in Selected Asian Countries

| Country     | Interest Rate Controls   | Credit Controls   | Capital Controls   |
|-------------|--|---|--|
| Indonesia   | Direct controls lifted in 1983; further liberalization through 1985, mostly comprising one-off measures rather than gradualism.  | Largely lifted as part of 1983 reforms.   | Virtually no restrictions for extended period ("Singapore effect"); <sup>1</sup> domestic residents may undertake foreign borrowing and maintain foreign currency deposits.  |
| Korea       | Move towards unified rates in early 1980s; liberalization of most short-term rates in December 1988 was short-lived. Significant deregulation of rates only from 1993. | Reduction in directed lending programs throughout 1980s.                                | Capital flows restricted; some liberalization in late 1980s, but mainly for non-banking flows.   |
| Malaysia    | Most rates liberalized in 1978; some high ceilings on loans to 'priority' sectors maintained.  | Greatly reduced through 1980s; some continued reliance on Central Bank 'moral suasion'. | Virtually no restrictions on capital transactions until 1993 when reserve requirements placed on foreign deposits temporarily in an attempt to stem short-term capital inflows. "Singapore effect" important. <sup>1</sup> |
| Philippines | Rates liberalized in early 1980s; subsequently market determined.  | Remaining controls directing credit to priority sectors are not binding.                | Capital flows largely unrestricted; formal abolition of most controls on outflows in 1992; inflows permitted throughout 1980s ("Hong Kong effect" <sup>1</sup> ) although not sizable of late.                             |

Table 3 (concluded). Financial Liberalization in Selected Asian Countries

| Country   | Interest Rate Controls   | Credit Controls  | Capital Controls   |
|-----------|--|--|--|
| Sri Lanka | Rates liberalized in 1977; but lack of competition in banking sector has limited extent to which rates are market determined.  | Not entirely removed until 1986, although enforced patchily; some reimposition in late 1980s.  | Capital flows restricted, though restrictions on inflows are not extensive.  |
| Thailand  | Gradual liberalization throughout 1980s but main reforms implemented in late 1980s. Long rates freed entirely in 1989; short rates in 1990 and savings and loan rates in 1992. | Selective credit policy pursued. Ceilings on bank credit relaxed in 1988 and abolished in 1990; ceilings were generally accommodating through 1980s. | Relatively free; some restrictions on outflows of domestic residents; "Singapore effect" again important. <sup>1</sup> |

<sup>1</sup>Countries close to large international financial centers such as Hong Kong and Singapore have often found capital controls difficult to enforce given the potential for evasion, especially where there are family and other direct ties between domestic residents and the financial center.

Table 4. Selected Asian Countries: The Transition to Open Financial Markets

| Country     | FRE to DLE   | DLE to ILE   |
|-------------|--|--|
| Indonesia   | 1983   | Capital account free throughout. <sup>1</sup>  |
| Korea       | Started early 1980s; significant deregulation of interest rates only since 1993. | Capital account highly restricted. <sup>2</sup>                                      |
| Malaysia    | 1978   | Capital account generally free; <sup>1</sup> controls temporarily reimposed in 1993. |
| Philippines | Early 1980s  | 1992; although inflows largely unrestricted prior to 1992. <sup>1</sup>              |
| Sri Lanka   | 1977   | Controls on outflows maintained throughout.  |
| Thailand    | Gradually through 1980s; significant liberalization in late 1980s.               | Inflows free; <sup>1</sup> controls on outflows abolished late 1980s/early 1990s.    |

<sup>1</sup>Proximity to large international financial centers (Hong Kong and Singapore), especially as regards the cross-border business interests of wealthy domestic residents, has limited the potential and actual effectiveness of capital controls in these countries.

<sup>2</sup>The liberalization of capital controls in Korea referred to in the main text took place in the context of the financial reforms of the mid-1960s (as described in McKinnon (1973, 1993)). This lies outside our sample, which focuses on the period since the mid-1970s.

Table 5. Financial Liberalization in Selected African Countries

| Country    | Interest Rate Controls   | Credit Controls   | Capital Controls   |
|------------|--|---|--|
| Ghana      | Maximum bank lending rates and minimum deposit rates liberalized in September 1987. Minimum bank savings rate liberalized in February 1987.  | In November 1990, the requirement for bank lending to the agricultural sector abolished.  | Unification of exchange markets in November 1990 implied significant capital account liberalization, although controls on outflows only liberalized in February 1994.        |
| The Gambia | Controls on bank lending and deposit rates lifted in September 1985, although there is a requirement that bank deposit rates on three-month deposits be set at 3 percentage points below the prevailing interest rate on treasury bills. | Ceilings on bank credit abolished in November 1990.   | The Exchange Control Act was suspended in January 1986, resulting in the abolition of all capital account restrictions.  |
| Madagascar | Liberalization process began in 1985, but controls were gradually eased. Since November 1990, there have been no controls on deposit and lending rates.  | Despite liberalization, real interest rates have remained negative due to problems with state-owned banks which are still subject to non-market lending criteria. | Capital account liberalized in May 1994, when residents and non-residents were permitted to hold foreign currency accounts.  |
| Malawi     | Some lending rates liberalized in 1987 and commercial bank interest rates liberalized in April 1988, but interest rates strongly influenced by central bank guidance.  | Credit ceilings abolished in January 1991.  | There are no restrictions on inward portfolio investment or on repatriation of dividends and profits, but residents are in general not permitted to transfer capital abroad. |

Table 5 (concluded). Financial Liberalization in Selected African Countries

| Country | Interest Rate Controls   | Credit Controls   | Capital Controls   |
|---------|--|---|--|
| Kenya   | Ceilings on lending rates removed in July 1991.  | Central bank credit guidelines for lending to certain sectors, although still retained, have not been enforced since July 1991. | Offshore borrowing by residents allowed in February 1994, although still subject to quantitative limits. Complete freedom of offshore borrowing implemented in May 1994. Remaining restrictions on inward portfolio investment lifted in January 1995. |
| Zambia  | Bank deposit and lending rates freed in mid-1992, although administered rates were increased in 1990 to attain positive real interest rates. | Directed credit programs relaxed at the same time as interest rate liberalization in late 1992 and early 1993.                  | Abolished exchange controls in December 1993, thereby effectively lifting all restrictions on capital transactions. In November 1990, there was some easing of limits on remittances of profits and dividends.   |

Table 6. Selected African Countries: The Transition  
to Open Financial Markets

| Country    | FRE to DLE   | DLE to ILE   |
|------------|--|--|
| Ghana      | 1987-88  | 1993. Control on outflows liberalization in 1993; restrictions on inflows eased in 1990. |
| The Gambia | 1985   | 1986   |
| Madagascar | Began in 1985. All controls on domestic lending and deposit rates lifted in November 1990. | 1994   |
| Malawi     | 1987-88  | No capital controls on capital inflows since the mid 1980s.                              |
| Kenya      | 1991   | 1994   |
| Zambia     | 1992   | 1994. Some easing of restrictions in 1990.   |

The analysis of indicators and attainment of intermediate targets are important components of a policy strategy aimed at the maintenance of macroeconomic stability throughout the liberalization process. The objective here is to assess what financial indicators offer the correct signals about real macroeconomic developments and financial deepening during the financial liberalization process.

However, first it is necessary to determine whether financial liberalization was effective, resulting in an expansion of the financial system as predicted by our simple model. The extensive literature on the optimal sequencing of reforms [McKinnon (1982, 1993), Edwards (1984)] has emphasized the need to attain macroeconomic stability--especially fiscal balance--as a prelude to financial deregulation. Of course, the elimination of macroeconomic imbalances is a worthwhile goal of itself. Table 7 presents the key indicators of macroeconomic stability during the years preceding the implementation of domestic financial liberalization for the selected Asian and African countries, respectively.

In the absence of a well defined theory of the equilibrium real exchange rate in developing countries, real exchange instability is used as a proxy for disequilibrium. Averages for the three and five years preceding interest rate deregulation are shown. Although fiscal and current account deficits persisted in the Asian countries, with the exception of the government deficit in Sri Lanka and to a lesser extent the current account deficit in the Philippines, they are not extreme (Table 7). Price inflation is moderate and, although data limitations make evaluation problematic in some cases the real exchange rate is relatively stable.

The situation is markedly different in Africa: a number of countries have attempted to implement financial liberalization in an environment of ongoing inflation (Table 7). In Ghana, inflation was running at more than 20 percent when interest rates were deregulated; in Zambia, inflation was over 100 percent, and rising. Partly in consequence, real exchange rates were unstable. Moreover, the fiscal deficit remained large in relation to national income in many of these countries, suggesting that the initial fiscal stabilization required for the "optimal" order of economic liberalization may have proved inadequate.

Moreover, the success of financial reform is contingent on broader structural reform to the economy as a whole. The development of the financial system, and especially its ability to extend credit to the private sector, requires the simultaneous implementation of policies aimed at promoting private activity more widely throughout the economy. If there are no creditworthy potential private borrowers, even deregulated banks will continue to lend predominantly to the government, especially when fiscal conditions give the Treasury a large appetite for funds.

Table 7. Selected Asia and African Countries: Macroeconomic Stability  
Prior to Domestic Financial Liberalization<sup>1</sup>

(In percent of GDP, unless otherwise noted)

|             | Reform | Preceding<br>Years <sup>2</sup> | Current<br>Account | Fiscal<br>Balance <sup>3</sup> | Inflation<br>(annual %<br>change) | Real<br>Exchange Rate <sup>4</sup><br>(annual %<br>change) |
|-------------|--------|---------------------------------|--------------------|--------------------------------|-----------------------------------|--|
| Asia        |        |                                 |                    |                                |                                   |  |
| Indonesia   | 1993   | 1979-83 (5)                     | -1.9               | -1.5                           | 14.8                              | --   |
|             |        | 1981-83 (3)                     | -4.8               | -3.4                           | 11.2                              | 11.1   |
| Korea       | 1985   | 1980-84 (5)                     | -4.3               | -2.5                           | 12.6                              | 8.0  |
|             |        | 1982-84 (3)                     | -2.3               | -2.0                           | 4.3                               | 2.7  |
| Malaysia    | 1978   | 1979-78 (5)                     | -0.3               | -4.3                           | 6.8                               | --   |
|             |        | 1976-78 (3)                     | 2.9                | -4.6                           | 4.1                               | --   |
| Philippines | 1984   | 1979-83 (5)                     | -5.4               | -2.5                           | 13.9                              | --   |
|             |        | 1981-83 (3)                     | -4.8               | -3.6                           | 10.9                              | 6.8  |
| Sri Lanka   | 1977   | 1973-77 (5)                     | -0.4               | -9.2                           | 6.2                               | --   |
|             |        | 1975-77 (3)                     | 0.4                | -10.8                          | 3.1                               | --   |
| Thailand    | 1989   | 1984-88 (5)                     | -2.4               | -1.8                           | 2.3                               | 7.1  |
|             |        | 1986-88 (3)                     | -0.9               | -0.2                           | 2.7                               | 5.4  |
| Africa      |        |                                 |                    |                                |                                   |  |
| Ghana       | 1988   | 1983-87 (5)                     | -1.6               | -2.8                           | 47.4                              | 36.5   |
|             |        | 1985-87 (3)                     | -2.0               | -2.9                           | 24.9                              | 25.0   |
| Gambia      | 1985   | 1981-87 (5)                     | -5.9               | -9.5                           | 12.6                              | 11.0   |
|             |        | 1983-85 (3)                     | -4.1               | -9.7                           | 15.6                              | 15.2   |
| Madagascar  | 1990   | 1985-89 (5)                     | -5.4               | -7.8                           | 15.2                              | 12.7   |
|             |        | 1987-89 (3)                     | -5.0               | -8.4                           | 16.9                              | 13.8   |
| Malawi      | 1988   | 1983-85 (5)                     | -3.6               | -7.6                           | 16.2                              | 7.7  |
|             |        | 1985-87 (3)                     | -2.9               | -7.9                           | 18.8                              | 8.6  |
| Kenya       | 1991   | 1986-90 (5)                     | -4.7               | -4.7                           | 8.6                               | 5.8  |
|             |        | 1988-90 (3)                     | -5.7               | -3.9                           | 11.3                              | 3.4  |
| Uganda      | 1994   | 1990-94 (5)                     | -7.7               | -9.9                           | 23.8                              | 16.4   |
|             |        | 1992-94 (3)                     | -7.1               | -11.5                          | 7.7                               | 12.1   |
| Zambia      | 1992   | 1988-92 (5)                     | -2.6               | -7.7                           | 115.3                             | 16.8   |
|             |        | 1990-92 (3)                     | -1.7               | -5.9                           | 131.4                             | 12.6   |

<sup>1</sup>Source, World Economic Outlook database.

<sup>2</sup>The number in parentheses is the number of the years preceding the implementation of reform over which data are averaged.

<sup>3</sup>Central government budget balance.

<sup>4</sup>Year-on-year average absolute percent change.

A stable macroeconomic environment need not be the only necessary precondition for successful financial liberalization. Financial stability is also important. Moreover, the two are likely to be intimately connected. Previous macroeconomic difficulties and poor supervision of banking activities may have led to a large number of non-performing loans on bank balance sheets. Government ownership of banks in many developing countries has resulted in the emergence of "soft-budget-constraint" financial institutions (McKinnon (1993)) whose solvency depends on the provision of subsidized credit by the central bank. Such banks are not financially constrained: conceptually, their activities are closer to the provision of government subsidies financed by borrowing from the central bank than commercial lending as conventionally understood in developed market economies.

Unfortunately, precise information on bad loans and soft budget constraints is not available for the countries in our sample. Where non-performing assets are inherited from the pre-reform era, substantial restructuring of bank balance sheets may be required. This has been attempted in Ghana in 1989-90 and Indonesia in 1992-93, in concert with attempts to privatize publicly-owned banks and improve prudential supervision of the financial sector.

The success of financial liberalization is contingent on the emergence of a well behaved financial sector. Experiences in the transition economies of eastern Europe and elsewhere have demonstrated that soft-budget-constraint entities will behave quite differently from well-behaved market institutions. Even in nominally market economies, attempts to harden the budget constraints of banks may be impaired by the existence of non-performing assets. Banks that have become dependent on easy central bank credit may not be commercially viable. In such cases, the deregulation of interest rates and other aspects of financial liberalization may be insufficient to generate either the increase in financial depth or, the improved allocation of saving to their most productive uses under-pinning the financial liberalization paradigm.

A financial sector reform should be accompanied by the adoption of international practices in the regulation and supervision of banks, greater transparency of accounts, increased competition and the establishment of powerful, effective and independent banking regulators. These are pre-conditions for the emergence of a well-behaved financial sector. The absence of such pre-requisites in Africa has prevented the emergence of some of the benefits of financial liberalization. For example, the introduction of limited competition between banks has not resulted in lower spreads between deposit and lending rates.

## VI. Financial Deepening Following Liberalization

The above discussion suggests that the macroeconomic environment for financial liberalization may have been less favorable in a number of African

countries. The implications of this for the process of financial deregulation are assessed by examining the immediate post-reform behavior of a number of key financial variables. As noted in the previous section, the *de jure* abolition of formal restrictions may not correspond to *de facto* liberalization if informal official intervention remains extensive. Charts 2 through 13 show the behavior of real interest rates and indicators of "financial depth" (measured as the ratio of credit and money to GDP) in the selected countries after the initial stage of reform.

Following financial liberalization in Indonesia, Malaysia, and Thailand, real interest rates reached positive levels and substantial financial deepening was achieved. This is most evident in Indonesia, where the ratio of both broad money and private sector bank borrowing to GDP rose dramatically, from approximately 12 percent in 1983 to almost 50 percent in 1991 (Chart 2). Domestic liberalization in Malaysia occurred earlier and financial depth on this measure had already reached close to 50 percent by 1982 from approximately 20 percent in the mid-1970s (Chart 3). In Thailand (Chart 4) and Korea (Chart 5),<sup>1</sup> real interest rates, although subject to extensive official control, were kept positive even before liberalization of nominal rates occurred, resulting in substantial financial depth prior to the onset of reform.

In contrast, in the Philippines (Chart 6) and especially Sri Lanka (Chart 7), real interest rates are both less stable and, at times (corresponding to brief high inflation episodes), have been substantially negative. Financial depth is considerably lower in these cases although it did rise following the implementation of reform. Inspection of the charts suggests Sri Lanka is an intermediate case between the generally successful financial deepening experience in South East and East Asia and the lack of success in Africa. Financial depth is greater in Sri Lanka, but has not increased rapidly since the early 1980s.

In the Philippines--a country that suffered a severe macroeconomic setback in the mid 1980s associated first with large capital inflows, and then capital outflows--financial deepening, as measured by the ratio of private credit to GDP, was halted and substantially reversed, only starting to recover in the early 1990s. The magnitude of this cycle is markedly greater on the credit, rather than the conventional broad money, measure of financial depth. The latter suggests that the Philippines has made steadier progress in promoting financial development, albeit at a more modest pace than other south east Asian countries, with the set back associated with external developments confined to 1983-84. The credit measure--which our model suggests is preferable--belies this. Recall, from Tables 3 and 4,

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<sup>1</sup>This paper focuses on the role of the banking sector that is the major financial intermediary in the countries being considered. Therefore, we use bank deposit interest rates (as discussed in the data appendix). Other interest rates, such as those on Korean corporate bonds and money market instruments, have been higher.

that the Philippines has had few capital account restrictions. Therefore, this is a case where developments in private credit and broad money may diverge and where credit may offer the appropriate signals to policymakers.

Of the early African liberalizers, interest rate deregulation in the Gambia (Chart 8) resulted in a dramatic move to positive real rates; in Ghana (Chart 9), the process has been far slower, although modestly positive rates may now have been achieved. However, in neither case has substantial financial deepening occurred, at least not of the magnitude seen in a number of the Asian countries. It is noteworthy that progress has been especially slow in raising the credit to GDP ratio: in the Gambia, this has actually fallen substantially since interest rate deregulation, whilst in Ghana it has barely risen, despite an increase in the broad money to GDP ratio, from approximately 7 percent to nearly 12 percent of GDP. This may reflect government borrowing from the banking system necessitated by continuing fiscal problems in these countries.

In Madagascar, Malawi, and Kenya (Charts 10, 11, and 12), liberalization appears to have prompted a fall in real interest rates, rather than a rise to plausible, market-determined levels, and financial depth has remained at low levels. This may be symptomatic of soft budget constraints, continued government intervention, and other problems in the banking sector. For example, in Madagascar, financial sector reform was not accompanied by a greater use of indirect monetary instruments, which has thwarted the role of price signals in the capital markets and economy more widely. Commercial banks have been compelled to finance the Treasury at below market interest rates. Moreover, private commercial banks have been very cautious in extending credit to the private sector, given the high number of non-performing loans in this sector. The whole structure of interest rates has been dominated by the lower rates charged to the public sector, resulting in negative real rates. In Zambia (Chart 13), continued high inflation resulted in real interest rates that were substantially negative for a prolonged period. This severely retarded the development of the financial sector.

The contrasting behavior of credit and broad money in these countries emphasizes an important implication of the simple structural framework presented above. Broad money and credit can behave differently, as demonstrated by our model and borne out in the African data. The modest rise in the conventional measure of financial deepening (the ratio of broad money to GDP), suggests financial liberalization in these African countries has been at least partially successful. In contrast, our preferred measure--the ratio of private sector credit to GDP--implies entirely the opposite conclusion. The potential reasons for such differences are numerous: the magnitude of continued macroeconomic imbalances during the financial liberalization process appears prominent in these cases. Continued excessive public borrowing appears to have played a decisive role in causing credit and money measures to diverge, as discussed in the earlier theoretical section.

Chart 2. Indonesia: Financial Sector Development

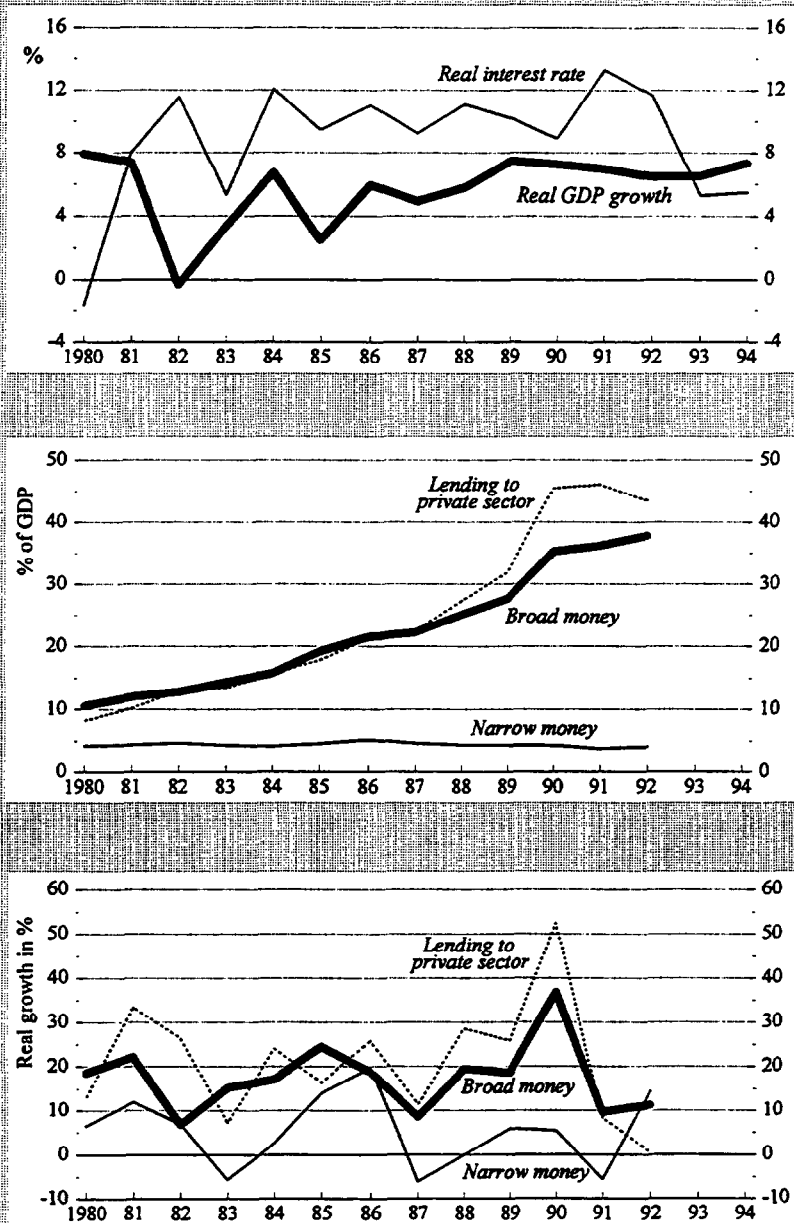


Chart 3. Korea: Financial Sector Development

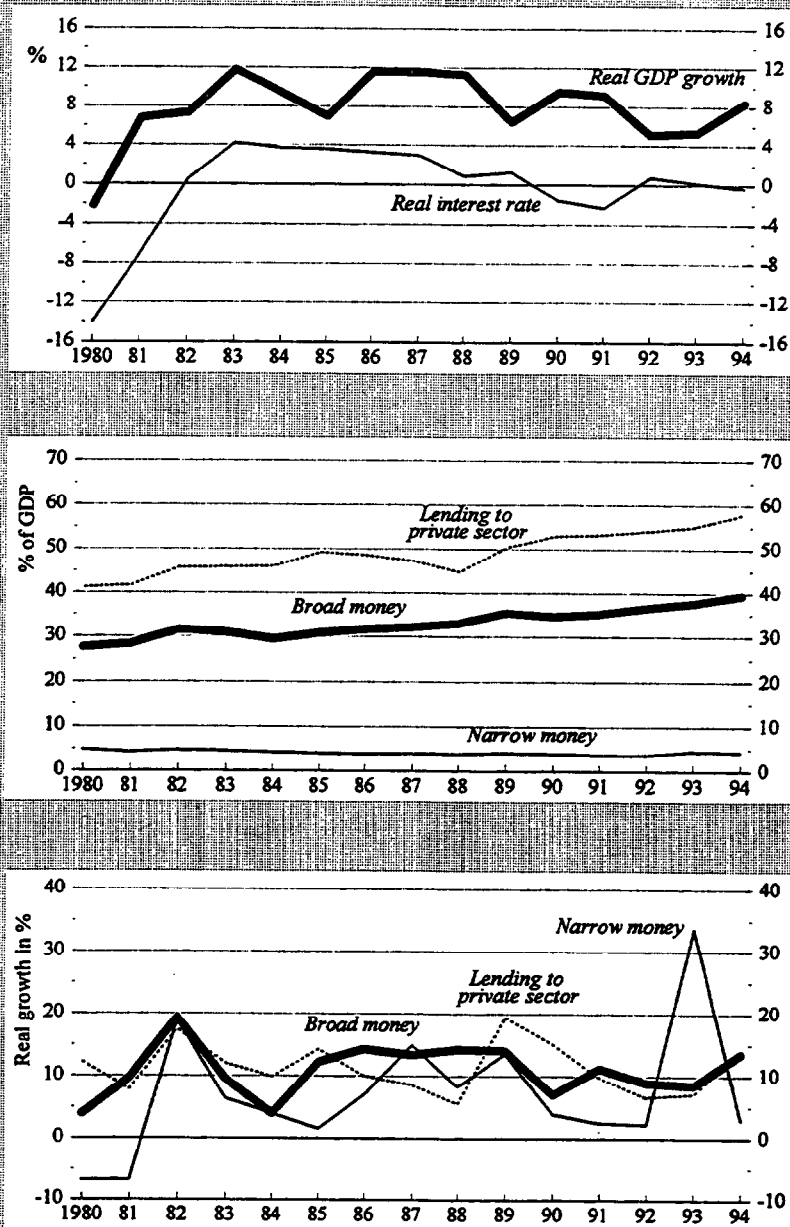


Chart 4. Malaysia: Financial Sector Development

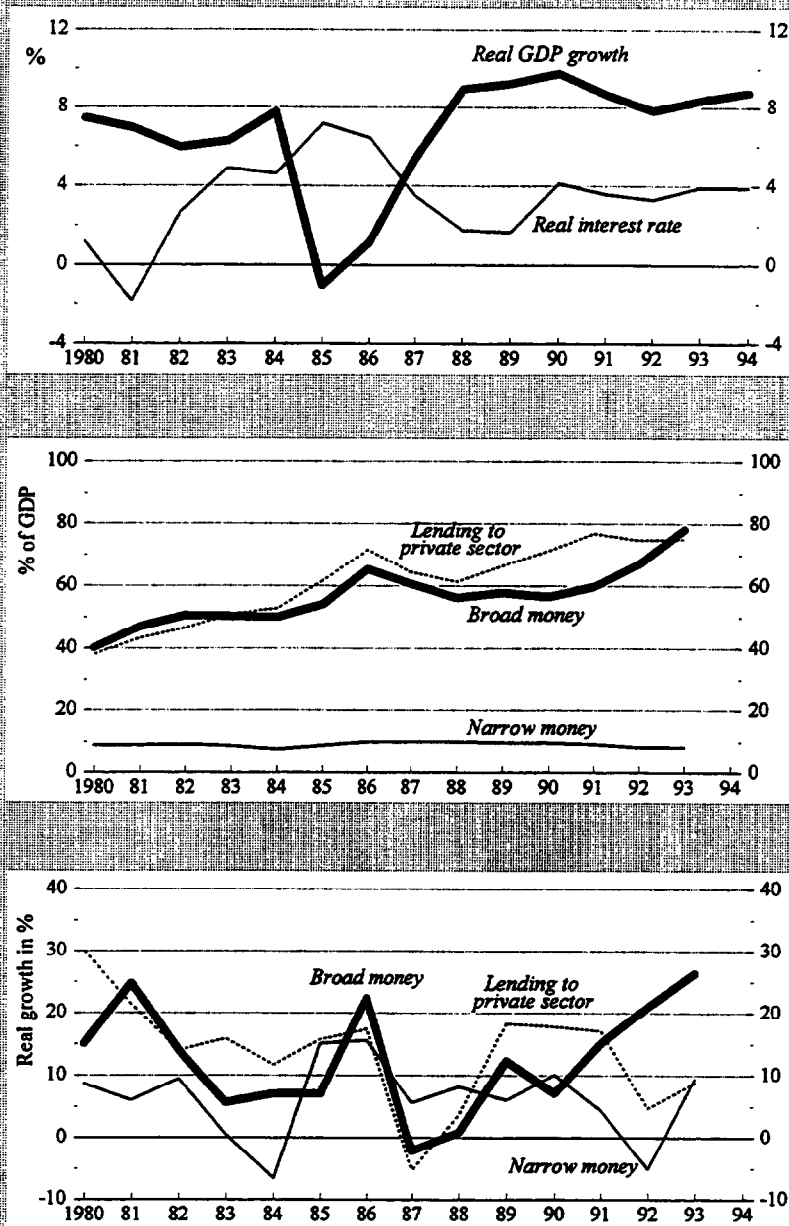


Chart 5. Philippines: Financial Sector Development

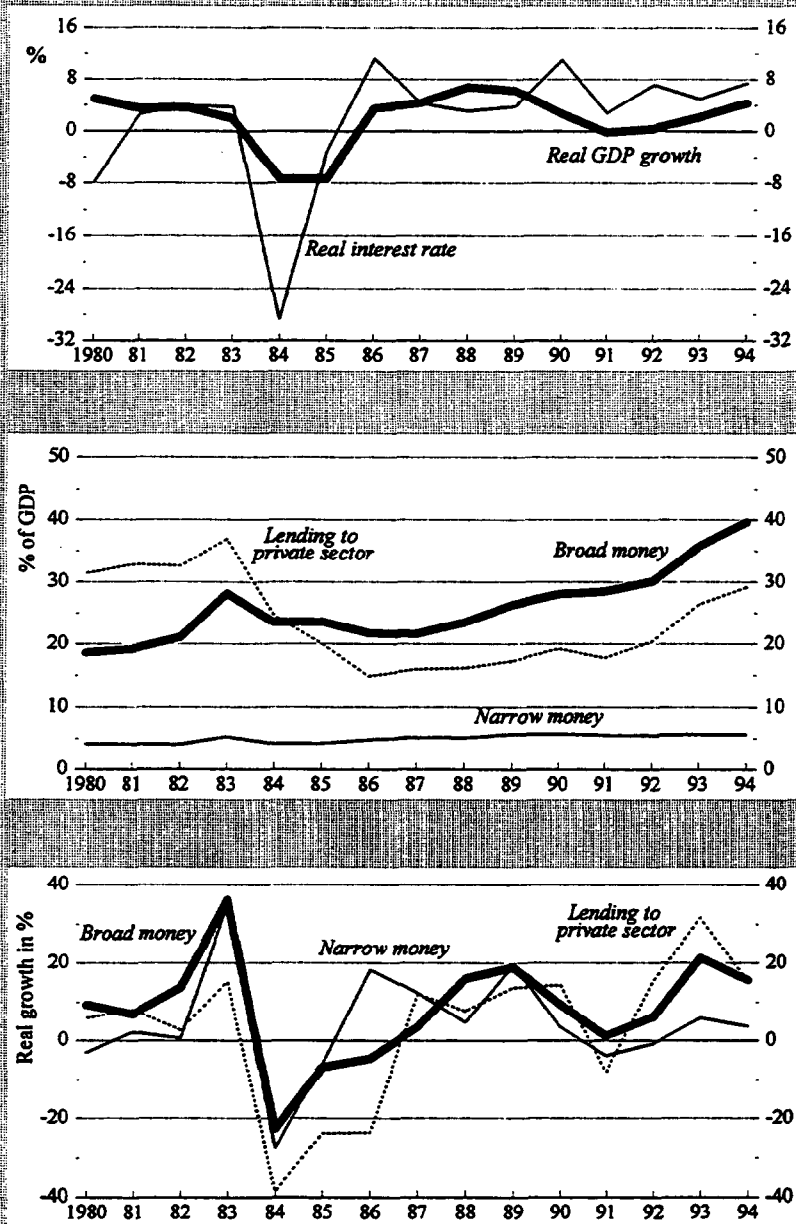


Chart 6. Sri Lanka: Financial Sector Development

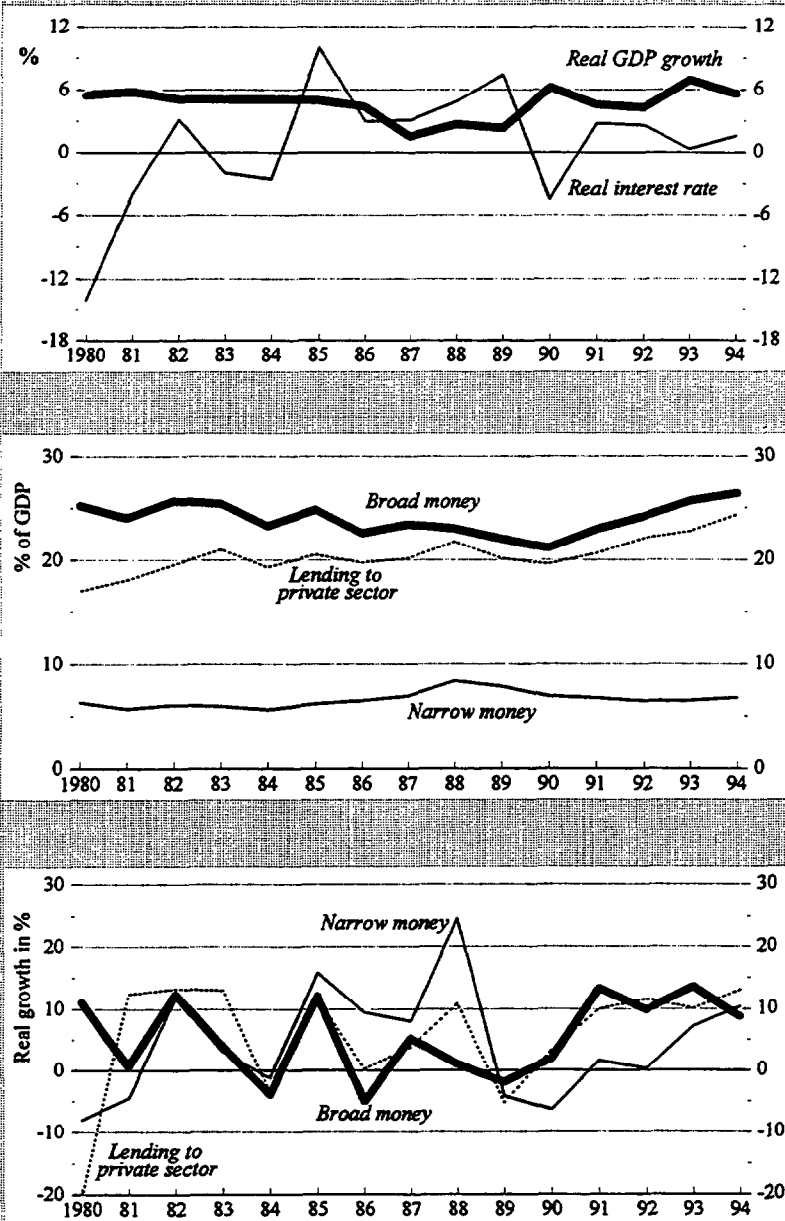


Chart 7. Thailand: Financial Sector Development

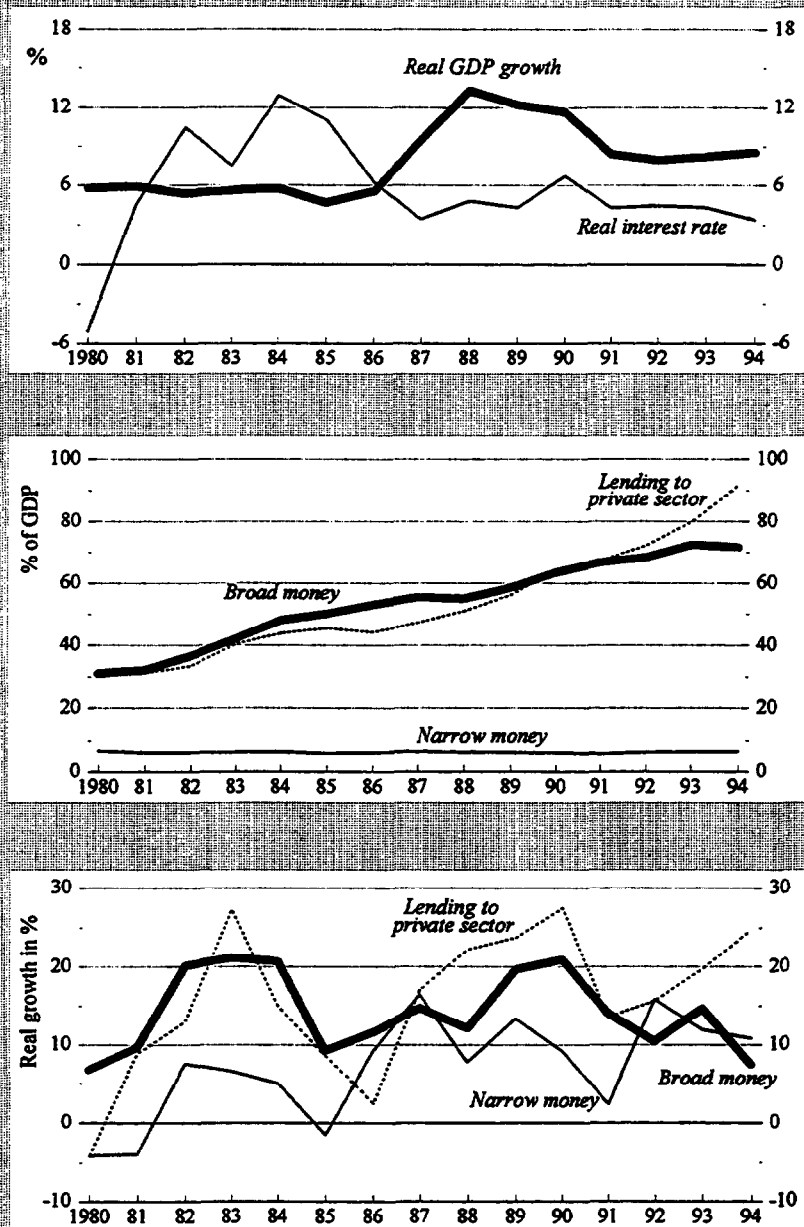


Chart 8. Ghana: Financial Sector Development

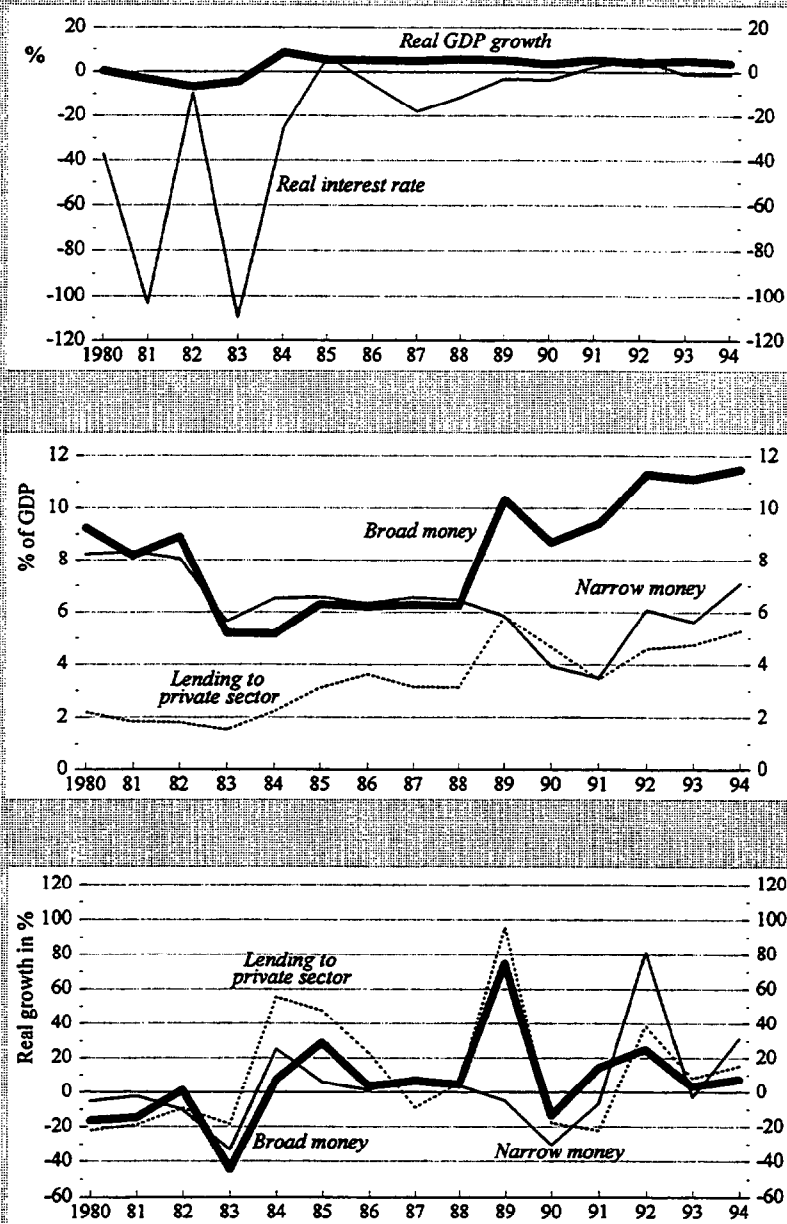
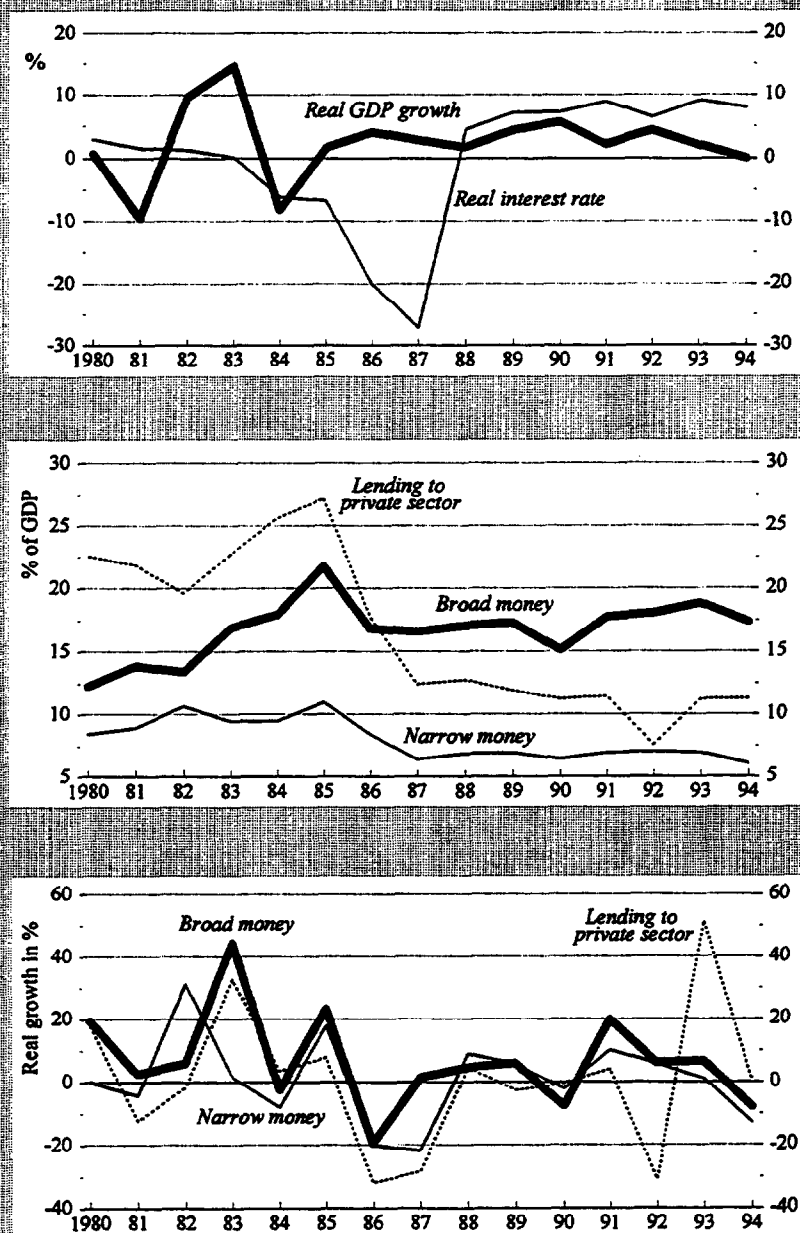


Chart 9. The Gambia: Financial Sector Development



**Chart 10. Kenya: Financial Sector Development**

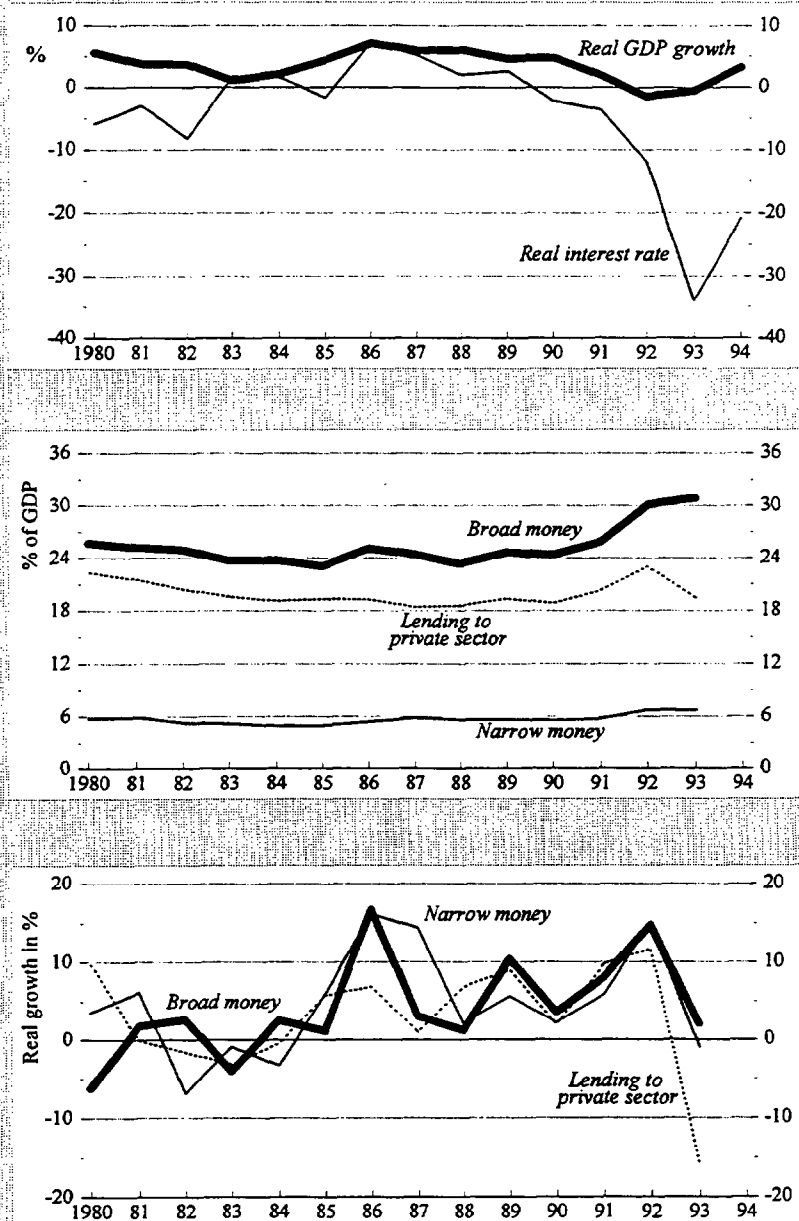


Chart 11. Madagascar: Financial Sector Development

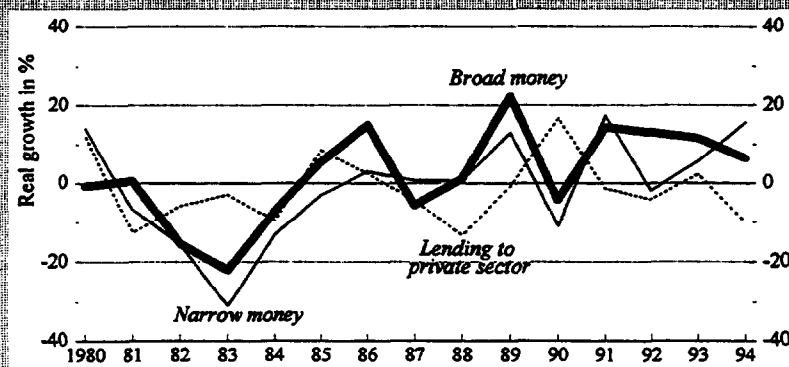
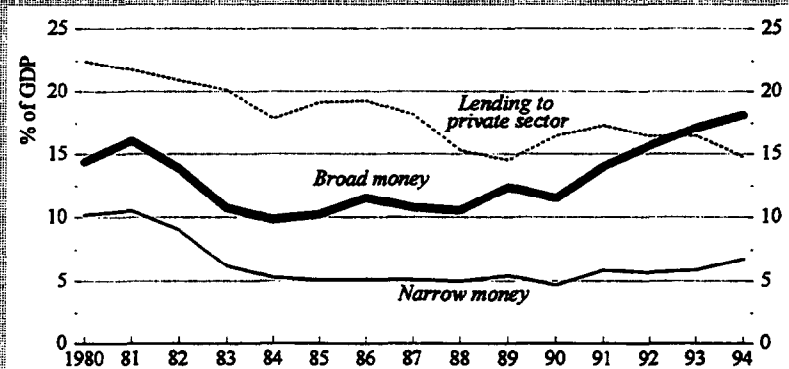
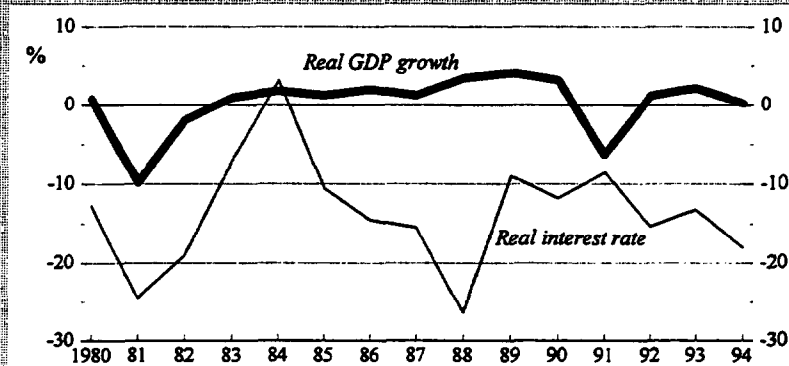


Chart 12. Malawi: Financial Sector Development

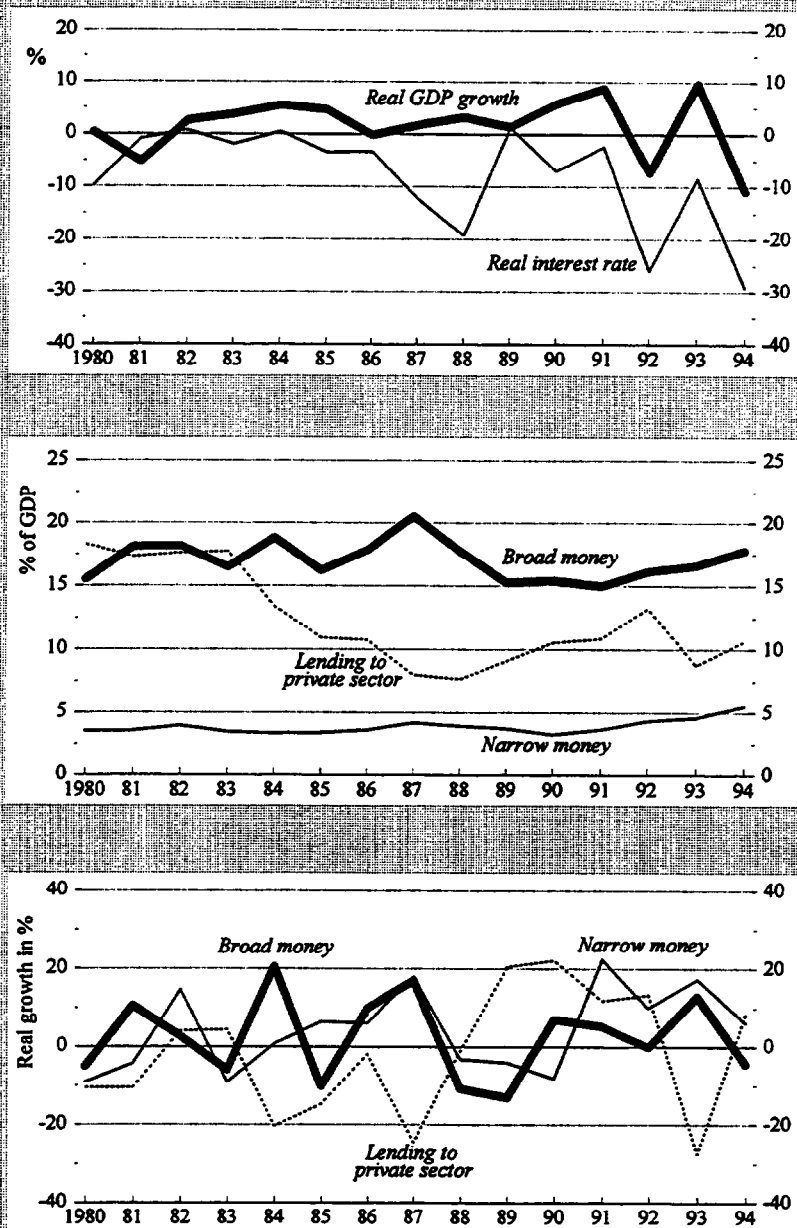
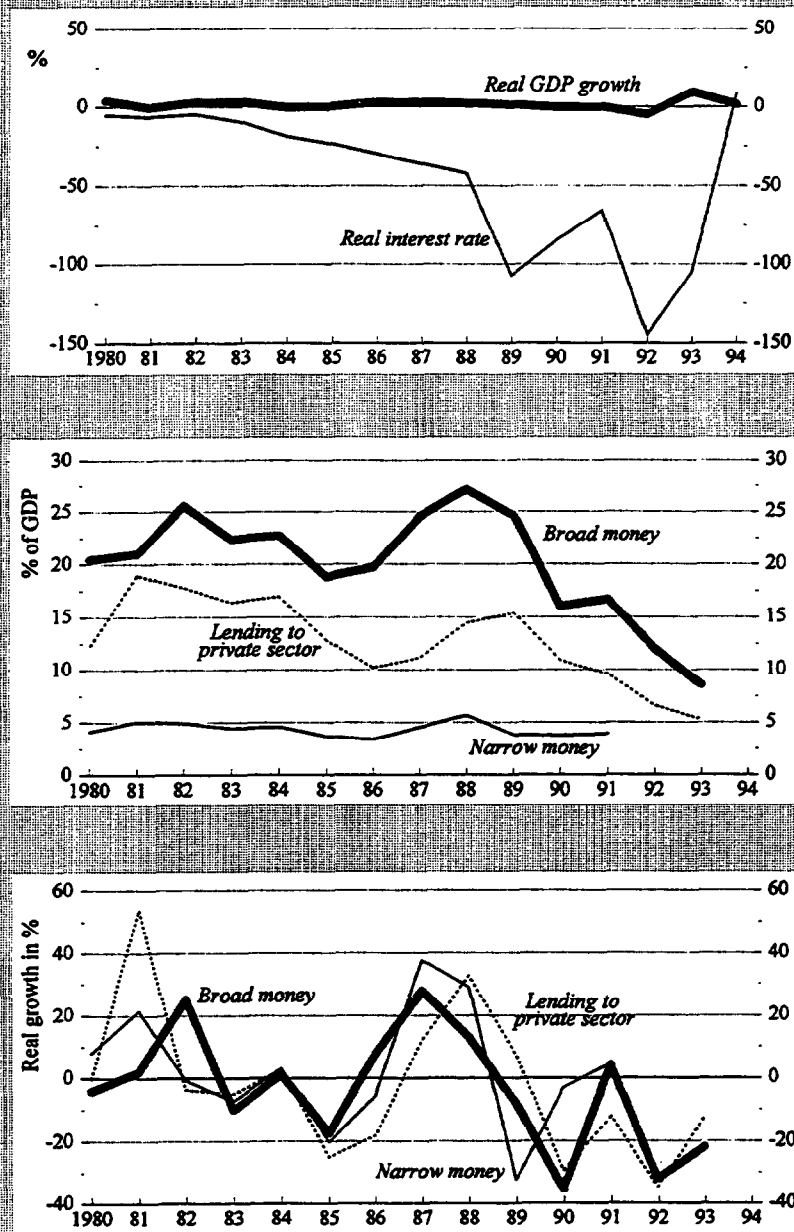


Chart 13. Zambia: Financial Sector Development



This exercise suggests that the financial liberalization policies have been far more successful in Asia than in Africa. Possible explanations for this--centered on continuing government intervention in the financial system prompted by the need for the central bank to offer soft credit to banks with non-performing loan portfolios--have been discussed above. If deregulation of the financial system has failed to produce a well-behaved competitive banking sector, one would not expect the indicator properties of financial variables to correspond to those suggested by our simple structural framework. That framework is based on the existence of well-behaved financial intermediaries, efficiently allocating saving to their most productive uses. Its predictions will not hold where financial deepening has failed to occur. This is borne out in African data: all financial variables, including the preferred private sector credit indicator, move erratically, even in the post-liberalization period, and appear to have little explanatory power for developments in the real economy.

This result contrasts with that obtained in some Asian countries. For example, following domestic interest rate deregulation in Indonesia, financial variables appear broadly correlated with real activity. Moreover, as befits a country with few restrictions on the cross-border movement of financial capital, private sector credit rather than broad money is the better indicator of real growth, a result entirely consistent with the predictions of our simple model.<sup>1</sup> Unfortunately, the relationship appears to break down in the early 1990s, perhaps the result of the development of non-bank financial intermediaries and securities' markets as discussed in Section IV above.<sup>2</sup> Similar results are obtained for Thailand, although the post liberalization period there is even shorter, making systematic analysis yet more problematic.<sup>3</sup>

## VII. Conclusions

This paper has presented a simple stylized two-stage model of the financial liberalization process that we believe is appropriate in the developing country context. The solution to the model suggests financial deregulation will affect financial variables, changing their indicator

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<sup>1</sup>This claim is supported by statistical evidence that real credit growth is a better predictor of GDP growth than real broad money growth. Given the limitations of the data, such evidence is necessarily weak and not reported formally here.

<sup>2</sup>Data availability is even more problematic for non-bank intermediation and securities' markets.

<sup>3</sup>A systematic econometric analysis of the relationship between financial variables and real economic activity is precluded by the availability, frequency and quality of the data. Moreover, only short sample periods are available in the post liberalization period, especially in Africa. This makes it almost impossible to draw strong empirical conclusions beyond the inevitably descriptive discussion above.

properties and usefulness as intermediate targets in ways that vary according to the extent of reform and the specific variable in question.

Conventional measures of the extent of "financial deepening" following liberalization--namely real interest rates [Gelb (1989)] and broad money to GDP ratios [Fry (1994)]--may give misleading signals about the success of reform and its implications for real activity. Existing analyses have neglected important issues relating to the openness of the capital account of the balance of payments, the extent of public borrowing from the domestic financial system, the development of non-bank financial intermediation and the competitiveness, ownership and efficiency of the banking sector. The framework presented here addresses some of these issues. The solution to the model suggests that a wide, private sector credit aggregate is the preferred financial indicator during periods of ongoing financial liberalization.

The empirical section of the paper sets about evaluating this result. An institutional appraisal of financial liberalization programs in a selected group of African and Asian countries is undertaken. These programs are mapped into the simple stylized framework. The success of financial reforms in stimulating growth in the financial sector is evaluated. Unfortunately, data availability is limited, and data quality poor, rendering systematic econometric evaluation impossible. However, some simple conclusions may be drawn.

The data demonstrate that financial liberalization decisively changes the behavior of financial indicators. Moreover, each indicator is affected differently, depending on the institutional background and extent of deregulation. In a number of Asian countries, where financial liberalization has created a well-behaved commercial banking sector, there is weak evidence that credit extended to the private sector is the preferred financial indicator of real activity, especially when the capital account of the balance of payments is open. In contrast, financial liberalization in Africa has failed to develop the financial sector and the behavior of financial indicators remains erratic, offering little guide to real economic activity. Nevertheless, careful interpretation of the data are required because different measures of financial development can give different signals about the success of reform. All these results are consistent with our framework.

Data Sources

All data used in this paper are from the International Monetary Fund's International Financial Statistics. The relevant line numbers are:

| Term in Paper         | IFS Term   | IFS Line Number  |
|-----------------------|--|------------------|
| narrow money          | reserve money  | 14               |
| broad money           | demand deposits and<br>time deposits of<br>deposit money banks | 24 + 25          |
| private sector credit | deposit money banks<br>claims on private<br>sector             | 22d              |
| nominal interest rate | deposit rate   | 601 <sup>1</sup> |
| price level           | consumer prices  | 64               |
| nominal GDP           | gross domestic product   | 99b              |
| real GDP              | gross domestic product<br>1990 prices                          | 99b.p            |

<sup>1</sup>There is no deposit rate available for Madagascar on the IFS so the discount rate (line 60) is used.

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