

**Monetary and Exchange Rate
Policy in Uganda**

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Abstract

This paper examines the importance of the “fundamentals” in real exchange rate determination and assesses whether the exchange rate is affected by monetary policy and whether these effects are permanent or transitory. The study is an empirical one and first estimates the real exchange rate and investigates whether deviations from the equilibrium real exchange rate are correlated with an expansionary monetary policy or disturbances in the money market. A model where the real exchange rate is explained by terms of trade, productivity, net capital flows, government expenditure and monetary shocks is specified, estimated, simulated and forecast as part of a system of simultaneous equations. Questions that the paper addresses include: How do you balance the inflation objective with the export sector competitiveness objective? Do monetary shocks have any effect on the real exchange rate? Is there a long run relationship between nominal money supply and the nominal exchange rate and do shifts in exchange rate regime have any effect on this relationship? Has monetary policy in Uganda been consistent with achieving international competitiveness?

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I. Introduction

The formulation and conduct of Monetary and Exchange Rate Policy is part and parcel of the macroeconomic policy framework in most developing countries. Low inflation and international competitiveness have become the enviable targets in those countries. While the real exchange rate is a proxy measure of international competitiveness, inflation mostly emanates from monetary expansion, currency devaluations and other structural factors. The importance of monetary and exchange rate policies is reflected by the current wave of liberalization of the financial markets and the current and capital accounts in the balance of payments.

The study assesses whether the exchange rate is affected by monetary policy and whether these effects are permanent or transitory. The rationale behind this is that the choice of the exchange rate regime is determined by many objectives. However, once this choice is made, the authorities are expected to adjust their fiscal and monetary macroeconomic policies to fit the chosen exchange rate policy. Furthermore, once the exchange rate regime has been chosen it determines the flexibility or independence of monetary policy.

Questions of interest in the study include:

Do monetary shocks have any effect on the real exchange rate?

Is there a long run relationship between nominal money supply and the nominal exchange rate and do shifts in the exchange rate regime have any effect on this relationship?

Has monetary policy in Uganda been consistent with the target of achieving international competitiveness? How do you balance the inflation objective with the export sector competitiveness objective? (Musinguzi, 1996, 1998; Musinguzi and Smith, 1998)

Has the official exchange rate been driven by the foreign exchange bureau rate?

Despite the importance of monetary and exchange rate policies in economic management, few studies have been done on Uganda to assess the relationship between them. It is already recognized in the literature that the real exchange rate is an endogenous variable that responds to both exogenous and policy induced disturbances and that prolonged real exchange rate misalignment will usually generate macroeconomic disequilibrium (see, for example, Elbadawi, 1994). Part of the policy induced disturbances come from the money market. There are some studies, for example, that have traced disturbances in the exchange rate to the disturbances in the money market in Latin America (see Hausman and Gavin, 1995).

II. Macroeconomic background

The National Resistance Movement Government (NRM) of Museveni, which came to power in 1986, inherited an economy that was in shambles and characterized by, among other things,

- a very high rate of inflation that eroded real incomes, hampered productive investment and damaged economic growth;
- total lack of financial control in government ministries and parastatals leading to huge budget deficits, financed by printing money, while public enterprises borrowed from government and banks to cover their losses;
- an exchange rate overvalued by almost ten times compared to the parallel market rate;

- a narrow export base which led to overdependence on coffee and tea as the major forex earners;
- an inefficient financial system, saddled with poor loan portfolio, poorly managed and improperly supervised financial institutions, administered interest rates that inhibited savings mobilizations; and
- a dilapidated infrastructure due to years of neglect and domestic insecurity. Social services like health, education and road networks were run down.

Overall the GDP had fallen between 1971 and 1980 by 40% and import volumes had declined by 50%. Production of export crops was disrupted, coffee shipments declined by 34% between 1976/77 and 1986/87, cotton production fell by 55% between 1978 and 1989, and tea production dropped by 70% during the same period. Inflation accelerated in the 1980s reaching an annual rate of 260% in 1987!

In response to these challenges, the Government launched a comprehensive Economic Recovery Programme (ERP) in May 1987 consisting essentially of a set of market-oriented economic policies intended to readjust the economy to the new realities. These efforts were mainly supported by aid flows including import support, project aid, commodity aid and debt relief, either through multilateral or bilateral arrangements.

The policy packages adopted emphasized tight monetary and fiscal policies. Main emphasis was placed on liberalizing the trade and payments regime as well as giving a more active role to market signals in price determination. The elimination of overvalued exchange rates was expected to adjust the relative price of tradable to non-tradable in a manner that would enhance export competitiveness.

The biggest success that has been scored by Uganda since the start of the liberalisation efforts has been in the foreign exchange market. Foreign exchange inflows have increased substantially since 1990. Private transfers and workers' remittances have risen since 1991/92 from US\$ 107.95 million to US\$ 303.49 million in 1993/94 and further still to US\$ 397.47 million in 1994/95. A marked increase in foreign investment has also occurred. Estimates indicate that portfolio investment, although limited, is growing. Foreign financing through equity rose from US\$ 5.165 million in 1993 to US\$ 27.317 million in 1994. The return of flight capital has also been a critical factor. These increased inflows, in addition to the 1994/95 coffee boom, may have been the major source of exchange rate appreciation in the mid-1990s which created problems of macroeconomic management.

The principal government objective is controlling inflation. This is being done through measures such as:

- Tighter control on government borrowing. Today Treasury Bills play more of a monetary role than a fiscal one. At the same time direct loans to public enterprises have been stopped, just as were excessive overdraft facilities extended on banks. Government has been a net saver with the banking system since 1992/93;
- Control of private sector borrowing through proper liquidity management in the banking system;
- Liberalization of interest rates. Monetary policy management has shifted from direct controls to indirect monetary management through open market operations;

- Increased use of the Reserve Money Programme (RMP);
- Introduction of austerity measures in government expenditure; and
- Reforms in tax policy, and creation in 1991 of the Uganda Revenue Authority (URA). The government took measures to expand the tax base, simplify the rate structure and improve the tax laws and administration.

These measures were intended to address the traditional sources of monetary instability in Uganda, that is, monetization of the fiscal deficit and excessive borrowing from the commercial banks. Uganda has now put in place a tight policy which with increased monetary deepening should keep inflation down. For the time being expenditure restraint is a strong force for stabilization and will remain the main instrument of control over growth of both base and broad money.

While the government has been fully committed to the objective of controlling inflation, the policy proposals suggested to address the issue of exchange rate appreciation during the mid-1990s were diverse. Careful study of the full implications of these policies on the economy showed a number of macroeconomic trade-offs. In case the government decided to defend a predetermined exchange rate that ensured competitiveness of the non-coffee exports, this would have implied BOU active intervention in the Inter-Bank Foreign Exchange Market on the “buy” side and injections of shilling liquidity into the economy and running the risk of inflation. Totally sterilizing such liquidity injections could have stabilized the shilling exchange rate but without necessarily depreciating it to the competitive level. It is also possible that sterilization could have led to higher interest rates or budget cuts. Budget cuts were not generally feasible, however, given the strong need for government to increase capital expenditures in economic and social sectors. The alternative of cuts in government recurrent expenditures had limited viability. As for high interest rates, financing of domestic investments would have been curtailed and this would in turn have weakened domestic demand.

Macroeconomic management in Uganda was therefore a very challenging task, given the inflows, the weakness of available monetary policy instruments and lack of viable options to assist non coffee exports. If government was to target subsidies to this sector, these could fail because of implementation problems. The issue of appropriate and additional monetary policy instruments for timely treatment of increased inflows needed to be addressed.

Some donors, for example, indicated the need to cut aid as a means of addressing the problem of appreciation. However, cuts in aid would have directly affected government budgeted expenditures and this could have unfavourably affected development programmes. The proposal of substituting increased taxation for foreign financing was also not possible in the short run.

More than 70% of Uganda's income is generated from agriculture, and this sector is mainly subsistence oriented, rendering it difficult to tax. The option of reducing foreign aid is also weakened when one considers Uganda's debt equation. Aid in the form of debt relief is welcome for the settling of Uganda's debt obligations, since this would in any case not appreciate the exchange rate. But the proposal to use windfall coffee revenues for accelerated debt repayment was not tenable because 72% of Uganda's debt, the bulk of which is owed to the IMF, the World Bank and the ADB, is at very low interest rates and the real return of the concessional resources to the economy is considerably much higher. The issue, therefore, is to

design an appropriate framework that can accommodate the increased inflows while maintaining export competitiveness and domestic price stability (Musinguzi, 1996, 1997, 1998, 1999).

III. Overview of the monetary and exchange rate policy management

Monetary and exchange rate policy, and the balance of payments

Since the Central Bank, the Bank of Uganda (BOU), assumed its primary responsibility of formulation and implementation of monetary policy following an amendment of the BOU Act in 1993, several instruments of monetary policy have been actively applied to regulate liquidity in the economy. The Reserve Money Programme (RMP) has helped to guide BOU's conduct of monetary policy to ensure that liquidity expansion is consistent with targeted inflation levels.

The BOU Research Department monitors developments in base money (in relation to the desired target path), inflation, interest rates and exchange rates, and, on the basis of the monthly Reserve Money Programme (RMP), advises the Monetary and Credit Policy Committee on the appropriate interventions needed (Musinguzi, 1994, 1996). The gap between the actual outturn of base money and the desired target path of base money then forms the basis for monetary policy intervention stance (ease or tighten or leave monetary policy unchanged). However, the mix of monetary policy instruments would be guided by the desired outturn in the final targets (inflation, exchange rates, interest rates and growth).

There is a narrow range of monetary instruments which have been used to conduct monetary policy, for example,

- open market operations involving foreign exchange deals, Repurchase Agreements (Repos), treasury bills and other securities to regulate liquidity;
- cash reserve requirements on demand, time and savings deposits to influence the monetary base;
- liquid assets ratio to ensure desired liquidity levels in the financial sector;
- bank rate to regulate commercial banks' borrowing from the central bank;
- rediscount rate to regulate liquidity by varying the policy margin above the four-week average yield on the 91-day treasury bills to permit alternative policy stances, easing, tightening or leaving the monetary policy stance unchanged as circumstances warrant;
- sterilisation measures using purchase or sale of foreign currency; and
- open market operations involving Bank of Uganda Bills (BOU Bills) for purely monetary policy purposes.

The policy of monetary restraint facilitated by increased fiscal savings with the banking system has helped tremendously in the control of inflation which has been brought down from about 260% in 1987 to the current low and stable single digit level. The average annual headline inflation and average annual underlying inflation for 1998/99 were -0.1% and 3.4%, respectively. Money supply (M2) growth used to be driven by expansion in net government borrowing from the banking system throughout the 1980s. Since 1992/93, this trend has been reversed. Annual inflation has been stable and in low single digit levels for many years. As monetary policy has moved away from the use of direct controls and trade and exchange

controls have been eliminated, interest rates and exchange rates have been determined increasingly by market forces.

Since 1987, Uganda has staged an impressive economic turnaround because of its disciplined monetary and fiscal policy and a conducive environment for investment. Economic growth has averaged 6.5 percent per annum during the last decade. Agriculture and manufacturing are the engines of growth.

The current account was liberalised in 1993, followed by capital account liberalisation in 1997, allowing free movement of capital into and out of the country. The result has been an increase in private transfers and foreign direct investment over the recent past.

The balance of payments has been strengthened and relations with external creditors have been normalised. Gross foreign exchange reserves, which covered about 2 weeks of imports of goods and non-factor services in 1986/87, have increased to about 5 months in 1998/99. Non-donor private foreign exchange inflows are now at about US\$1.4 billion. Uganda is the first country that qualified for the HIPC Debt Initiative and it is also eligible for the enhanced HIPC resources because of its good track record of macroeconomic policy management.

The creation of the Uganda Investment Authority (UIA) and its new Investment Code have facilitated both local and foreign direct investment, while Uganda's membership in the Multilateral Investment Guarantee Agency (MIGA) has also increased the attractiveness of the country as an investment centre. Investment is being encouraged in the sectors of tourism (including eco-tourism), agro-processing, horticulture, fish processing, construction, mining, manufacturing, hydro-electric power, merchant and investment banking, and infrastructure development.

At the regional level, monetary policy and fiscal policy are coordinated by the Monetary Affairs Committee and the Fiscal Affairs Committee, respectively, under the auspices of the East African Community (EAC). The Committees are serviced by the relevant Technical Committees. A set of EAC macroeconomic convergence criteria has been designed and approved to gear efforts towards maintenance of regional macroeconomic stability, achieve high real GDP growth and sustain regional development. This set is generally consistent with the set of convergence criteria monitored under the Monetary Harmonisation Program of the wider COMESA regional arrangement (Musinguzi, 1999).

Evolution of exchange rate policy

The most noticeable side of Uganda's adjustment efforts has been in the area of trade policy, foreign exchange market reforms and liberalisation of current account transactions. Key in the policy framework has been the need to eliminate distortions, which meant increased reliance on market mechanisms to guide resource allocation. During the period 1987-1993, Uganda made several attempts to unify the multiplicity of exchange rates that prevailed in the exchange market. The policy objective was to eliminate the overvaluation of the Uganda Shilling and to establish a unified market based rate that would provide a uniform price, which would promote efficiency in allocation of resources, growth and development (Musinguzi and Rweikiza, 1994; Musinguzi and Kihangire, 1994; Abuka and Sajjabi, 1996; Musinguzi and Ochieng, 1997).

After authorising full retention of all non-coffee export proceeds in early 1990, Government in July 1990 legalised the parallel market by licensing foreign exchange bureaux. The bureaux were permitted to conduct spot transactions at freely determined exchange rates and to satisfy most private sector demand for foreign exchange to finance visible and invisible payments in a bid to address popular concern about capital flight. The policy aimed to alleviate pressure on the official channel for foreign exchange and to provide further incentives to non-coffee exports. Surrender requirements on export proceeds, except coffee, were abolished and inflows could be converted at the market based bureaux rates. In other words, the move towards a market-based system was driven by the need to enhance export viability. More importantly, the reforms aimed at increasing the efficiency of the foreign exchange allocation processes and at the encouragement of foreign capital flows through an open and competitive exchange rate payments system.

The licensing of bureaux marked the first step in moving to a market based foreign exchange system. This step constituted an explicit acceptance of past policy mistakes and their consequences, and of the need to include the private sector participation in the market building efforts. Following legalisation, the bureaux market grew rapidly. The number of bureau increased from ten at inception to more than 80 by June 1995. Traded volumes increased from US\$ 248 million in 1991 to US\$ 818 million in 1994. Concomitantly, the Government maintained its policy of active and discretionary devaluation to support the balance of payments. As a consequence, the premium of the bureaux market exchange rate over the official rate declined from about 45% in July 1990 to around 5% in December, 1995.

IV. Literature review

The importance of real exchange positions in facilitating the adjustment process in low-income countries has been appreciated by many economists (Edwards, 1989; Elbadawi, 1989; Kiguel, 1992). Edwards (1989, 1994) argues that in the short run, real exchange rate responds to both real and monetary disturbances, and that inconsistently expansive macroeconomic policies will generate, in the short run, a situation of real exchange rate misalignment, that is overvaluation. Similarly, Elbadawi and Soto (1994) show that under a pegged nominal exchange rate, expansionary fiscal and monetary policy can be a cause of persistent real overvaluation.

These studies conclude that a proper alignment of the real exchange rate is a major determinant of economic performance. On the other hand, severe macroeconomic disequilibria and balance of payment crises in the developing countries are also often cited as the direct consequence of real exchange rate misalignment (Edwards, 1989 and Dornbush, 1982).

It is generally agreed that the real exchange rate is a very significant relative price in the economic system. This is because changes in the real exchange rate influence foreign trade flows, the balance of payments, the level and structure of production and consumption and therefore employment, the allocation of resources in the economy and domestic prices (Khan and Lizondo, 1987). Real exchange rate is seen as an important mechanism for transmitting trade shocks to changes in the current account.

The World Bank (1984) concludes that overvalued exchange rates in African countries led to dramatic collapse of the agricultural sectors. This is because overvalued exchange rates tended to undermine overall export and agricultural performance. Fosu (1992) has shown that the dismal performance of agricultural exports in Ghana could be explained by the trend of the real exchange rate during the post 1960 era.

Most studies have concentrated on explaining the domestic rate of inflation, where the nominal exchange rate enters as one of the explanatory variables (see Canetti and Greene, 1991; Killick and Mweha, 1989; Ndung'u, 1995). Only two of these studies attempt to establish a statistical relationship between money and the exchange rate. For example, in Canetti and Greene (1991) and Ndung'u (1995), money supply growth, inflation and the exchange rate (among other variables) are analysed in a vector auto-regressive (VAR) model. The authors find that money supply growth drives nominal exchange rate changes with no feedback effects. However, none of the above studies tries to link the real exchange rate movements to monetary policy or even directly explain the movements in the real or nominal exchange rate.

Kiguel (1992) argues that the exchange rate regime has limited effect on the real exchange rate and only affects it in the short run due to rigidities in domestic prices and wages. In Calvo et al. (1995), it is argued that the steady state real exchange rate is independent of (permanent) changes in monetary policy. They argue that this result depends on the fact that there is no direct steady state link in theory between inflation and the real exchange rate so that monetary shocks are related to real exchange rate misalignment. In the long run, De Grauwe (1994) argues that the correlation between money supply and the nominal exchange rate is relatively strong but tends to be lost in the short run. We would expect this relationship to be stronger in periods of nominal exchange rate flexibility.

Another strand of the recent literature has attempted to explain the effects of capital inflows on the real exchange rate and interest rate differential and on monetary policy response (see Asea and Reinhart, 1995). The phenomenon of increased private foreign capital inflows is fairly recent in Uganda and is the result of the recent wave of liberalisation of the financial market and foreign exchange market. This is a phenomenon that has been common in Latin America and Asian countries, and studies in this area have focussed on the responses of exchange rate and monetary policy to increased capital inflows and what should be the optimal exchange rate management (see, for example, Khan and Reinhart, 1995; Schadler et al. 1993).

In the 80s and early 90s, Uganda had long periods of expansionary fiscal and monetary policy, high and increasing debt service ratio and various terms of trade shocks. These macroeconomic policies and shocks had adverse effects on the stability of the exchange rate and the exchange rate regime. Disturbances in the exchange rate can be linked to the disturbances in the money market. For example, Hausman and Gavin (1995) try to relate volatility in the exchange rate to the volatility in the money market in Latin American countries. Eichenbaum and Evans (1993) try to relate monetary shocks to disturbances in the real exchange rate in the US. The underlying argument is that the exchange rate is affected by both real and monetary shocks. The shocks hitting the economy in turn determine to a large extent the exchange rate policy pursued.

The choice of exchange rate regime, however, is dependent on several other factors, such as the objectives pursued by the policy makers, the sources of the shocks hitting the economy

and the structural characteristics of the economy in question (see Aghevli et al. 1991 for detailed discussion). The underlying argument is that, whatever the objectives that determine the exchange rate regime, the authorities are presumed to adjust their domestic macroeconomic policies (especially monetary and fiscal policies) to fit the chosen exchange rate policy. The exchange rate regime in turn will determine the flexibility of the monetary policy pursued. However, in a developing country like Uganda, monetary policy is to a large extent driven by fiscal demands, and these fiscal demands rarely adjust themselves to the exchange rate policy in force.

V. Objectives, research questions and hypotheses

The objectives of the study were four-fold:

1. To examine the importance of the 'fundamentals' in the appreciation of the real exchange rate in Uganda.
2. To assess the link between monetary and exchange rate policy. The basic questions that are addressed are the following:

Does the exchange rate regime have any effect on the real exchange rate?
Do monetary shocks have any effect on the real exchange rate?
Is there a link between nominal money supply and the nominal exchange rate? In addition, do shifts in exchange rate regimes reflect any disturbances in this relationship?

3. To evaluate the effectiveness of monetary policy and the various exchange rate regimes which Uganda has gone through and to determine the Equilibrium Real Exchange Rate path (ERER). This should serve as an early warning signal for policy intervention.

Under-pin the appropriate balance between price stability and export sector competitiveness objectives, market stability, gross foreign exchange reserves and net international reserves build up, and overall real GDP growth buoyancy,

Strengthen the monetary-fiscal - external - real sector linkages.

Permit an assessment of the implications of the exchange rate deviations (positive and negative) from the Equilibrium Real Exchange Rate path on:

- Exports,
- Regional Trade,
- Current Account,
- Capital Flows,
- Balance of Payments,
- External Debt,
- Household Incomes and Poverty Eradication.

4. To investigate the operations of Bank of Uganda in the inter-bank market for foreign exchange and in the Treasury bills and other money markets, as Uganda makes the transition

to indirect monetary policy via open market operations (OMO) including Bank of Uganda Bills (BOU Bills) and Repurchase Agreements (REPOs). There is also urgent need to determine whether monetary and exchange rate policy and fiscal policy in Uganda have been consistent with targets of achieving export sector competitiveness, domestic inflation, build-up of gross and net international reserves, market stability and buoyancy in real GDP growth.

VI. Methodology and data collection

The study estimated linear and non linear 2SLS and non-linear 3SLS and carried out policy simulations of the RER using SAS, MICROFIT 4.0, HASH and SHAZAM econometric software. Published and unpublished data were obtained from the Bank of Uganda (BOU); commercial banks; Forex Bureaux; Ministry of Finance, Planning and Economic Development; Exporters and Importers Associations; Economic Policy Research Centre (EPRC); Uganda Revenue Authority; IMF; World Bank; UNDP; ILO; African Development Bank; United Nations Economic Commission for Africa (UNECA); Associates for International Resources and Development (AIRD), USAID EAGER research papers, seminars and the EAGER All-Africa Conference (1999); and MEFMI (1999). To capture institutional aspects interviews were conducted with officials from the BOU, Commercial Banks, line ministries, Forex Bureaux, exporters and cross border moneychangers. The interviews helped in identifying the behaviour of market participants, the extent of arbitrage and segmentation of foreign exchange markets, and the transaction costs involved. See also the problems of the current methodology of macroeconomic data compilation and projections in Musinguzi, Kihangire, Atingi, Abuka, Dhatemwa, Musisi and Mukasa (1999) and MEFMI (1999).

VII. A Model of Harmonised Macroeconomic Policy Linkages for Linear and Non-Linear 2sls And 3sls Estimation, Forecasting and Policy Simulations

The External and Monetary Sector Behavioral Equation Linkages

The policy-oriented analytical framework for harmonising external and monetary sectors will be derived from the three definitions of real exchange rates given in the equations below.

$$RER = PT/PN$$

$$EPPP = NER * PF/PD$$

$$RER = NER * WPI/CPI, \text{ where:}$$

RER=Real Exchange Rate

PT=Price of Tradable Goods

PN=Price of non-tradable goods

EPPP=Purchasing Power Parity Real Exchange Rates

NER=Nominal Exchange Rate

PF=Foreign Price Level

PD=Domestic Price Level

WPI=Whole Sale Price Index as a proxy for the foreign price level.

CPI=Consumer Price Index as a Proxy for Domestic Price Level

The Equilibrium Real Exchange Rate (ERER) is the Real Exchange Rate (RER) which is consistent with Internal and External Balance at full Employment (Edwards, 1989, 1994).

$$RER = F_1(RER^F, MONSHOCK) \dots \dots \dots (1)$$

Where $RER^F = RER$ Fundamentals, that is, longer term, sustainable values of

°Terms of Trade, TOT

°Productivity, PROD

°Capital Flows, KFLows

°Government Expenditure, GOV

See a thorough discussion of these underlying economic fundamentals in Edwards (1989, 1994).

Monetary Shocks, MONSHOCK, are proxied by an "Excess Liquidity" variable, EXLIQUID, defined as:

$$\ln EXLIQUID = \ln B_A - \ln B_P \dots \dots \dots (2A)$$

Where B_A = Actual Base Money path

B_P = Desired or Programmed Base Money demand path (with expected signs)

$$= F_2(\begin{matrix} + & - & + & ? \\ \text{Real GDP, Real Interest Rate, Inflation, Seasonality,} \\ ? \\ \text{Velocity} \end{matrix}) \dots \dots \dots (2B)$$

Thus, Expression (1) above can be reformulated as:

$$\ln RER = \alpha_0 + \alpha_1 \ln TOT + \alpha_2 \ln PROD + \alpha_3 \ln KFLows + \alpha_4 \ln GOV + \alpha_5 \ln EXLIQUID \dots \dots (3)$$

$$\alpha_1, \alpha_2, \alpha_3, \alpha_4 < 0; \text{ but } \alpha_5 < 0, > 0 \text{ or } = 0 \text{ (an empirical issue)}$$

The departure or deflection of the actual real exchange rate path (RER) from the equilibrium real exchange rate path (ERER) is measured by both the departure of the actual RER values from its trend or fundamental values and the magnitude of the monetary shock, market greed and panic. Plots of actual and fitted values, an analysis of the behaviour of the residuals, and policy simulations of the system following shocks to each independent variable from its fundamental values are useful in understanding the departure of the RER from the ERER, as shown in the appendix. Testing for the significance of the excess liquidity variable, EXLIQUID, requires the testing of the null hypotheses:

TEST H_{01} : $\alpha_5 = 0$; (No real appreciation or depreciation of RER relative to ERER);

TEST H_{02} : $\alpha_5 > 0$ (real depreciation of RER relative to ERER);

TEST H_{03} : $\alpha_5 < 0$ (real appreciation of RER relative to ERER).

The specified part of the system of equations and identities that links key determinants of real exchange rates in terms of "RER fundamentals" and monetary shocks in the economy as above, is completed through relevant additional endogenous variables of the major building blocks of the macroeconomy and a series of accounting identities and definitions as follows:

$$M2A = mB_A \dots \dots \dots (4)$$

Where m is the money multiplier; and $M2A$ is the broad money supply aggregate defined as currency outside banks plus private demand, time and savings deposits.

$$M3 = M2A + FXA \dots \dots \dots (5)$$

Where $M3$ is a broader money supply aggregate and FXA is foreign exchange account deposits held by residents.

1. The Real Export Equation

Consider a small country and price taker. The import and export prices are exogenously

determined in the world market and a small country has to accept them. It is a negligible supplier to the world commodity market and her exports are assumed to be constrained more by supply bottlenecks than by world demand. The supply of exports is specified as positively related to the Terms of Trade, TOT, namely, the ratio of export prices to import prices and positively related to RER and the capacity to produce in the export sector. The real exchange rate comes in to boost exports in the sense that it becomes more efficient to produce exportables rather than non-traded goods. Usually, in the conventional export function, exports are related to incomes of foreign importing countries. Here, given that a small country's exports constitute a very small proportion of the world supply, we can argue that the external element is not a limiting factor to a small country's exports, thus:

$$\ln X^S = f_0 + f_1 \ln \text{TOT} + f_2 \ln \text{RER} + f_3 \ln Y \dots \dots \dots (6A)$$

$$f_1, f_2, f_3 > 0$$

Where Y is real income. In the actual estimation, the index of industrial production has been used instead of Y. Both data series are inadequate but the former is available on a monthly basis while the national accounts data are available on an annual basis. A thorough disaggregation of exports and all the data used is also useful. See also MEFMI (1999) and Musinguzi, Kihangire, Atingi, Abuka, Dhatemwa, Musisi and Mukasa (1999).

Export price and import price indices are used to derive TOT and they are more appropriate deflators for exports and import values than the domestic price indices. See also Stryker and Jebuni (1999) in the case of the Ghana economy model.

The difference between real exports in the current and previous periods is assumed to be proportional to the adjustment of desired real exports, X^S_T to one-period lagged real exports, X_{T-1} as follows:

$$(\ln X_T - \ln X_{T-1}) = \lambda (\ln X^S_T - \ln X_{T-1}); \lambda > 0,$$

The real exports equation can be simplified to:

$$\ln X_T = \theta_0 + \theta_1 \ln \text{TOT} + \theta_2 \ln (\text{RER})_T + \theta_3 \ln Y^* + \theta_4 \ln X_{T-1} + U_t$$

$$\dots (6B)$$

$$\theta_1, \theta_2, \theta_3, \theta_4 > 0; \theta_4 = 1 - \lambda$$

2. The Real Import Equation

Imports can be divided into two major activity groups: consumer goods, and capital goods and raw materials. Imports of consumer goods are related to domestic demand and the real exchange rate while imports of raw materials and capital goods are assumed to be related to the production level or the capacity utilization rate in the manufacturing sector. Therefore, the desired demand for real imports, Z^D , is related to the amount of real expenditures (real domestic absorption), and the real exchange rate as follows:

$$\ln Z^D = \omega_0 + \omega_1 \ln A_T + \omega_2 \ln \text{RER} + \omega_3 \ln \text{PROD} \dots \dots \dots (7A).$$

$$\omega_1, \omega_3 > 0; \omega_2 < 0$$

Where Z^D is the desired volume of imports, noting that project imports need to be thoroughly disaggregated from total imports as they do not respond to the RER signals differently. RER is the real exchange rate and A is real expenditure, which can be defined as the sum of real private consumption, real government expenditure (disaggregated as nonproject government and project expenditure) and real investment; that is, $A = C+G+I$ (these variables have been deflated).

The demand for imports is related to expenditures instead of income as is usually the case in the standard specification of the import function. The rationale is that it is more logically suitable to relate imports to domestic demand for all goods rather than to the sum of domestic goods and foreign demand for domestic goods. The difference between imports in the current and previous periods is assumed to be proportional to the adjustment of desired real imports, Z_T^D to one-period lagged real imports, Z_{T-1} as follows:

$$(\ln Z_T - \ln Z_{T-1}) = \vartheta (\ln Z_T^D - \ln Z_{T-1}); \quad 0 < \vartheta < 1. \quad \dots\dots\dots (7B).$$

This implies that;

$$\ln Z_T = \xi_0 + \xi_1 \ln A_T + \xi_2 \ln RER + \xi_3 \ln PROD + \xi_4 \ln Z_{T-1} + U_8 \quad \dots\dots (7C).$$

$$\xi_1, \xi_3, \xi_4 > 0 ; \xi_2 > 0$$

3. Fiscal Sector

The revenue-expenditure relationships of the Government are modelled to capture the implications of depreciation/appreciation on Government's fiscal balance. Real depreciation of the shilling improves current account, through promotion of the export sector's competitiveness but it also increases the shilling value of debt servicing obligations and imports thus widening the budget deficit.

3.1. Real Government Expenditure Equation

The factors influencing real public expenditure can be categorized into two:

- i. Input cost effects which include domestic price level, real tax revenue, real income, donor budget disbursement (measured by grant and aid disbursement), and lagged real government expenditure.
- ii. The inflation influence on the content of the government budget to capture the effect of money illusion (Musinguzi, 1991). An increase in inflation lowers the real value of government expenditures.

The real public expenditure equation can then be expressed as:

$$\ln G = \gamma_0 + \gamma_1 \ln T + \gamma_2 \ln P + \gamma_3 \ln Y + \gamma_4 \ln DBD + \gamma_5 \ln G_{T-1} + U_3$$

$$\dots\dots\dots (8).$$

$$\gamma_1, \gamma_3, \gamma_4, \gamma_5 > 0 ; \gamma_2 < 0$$

3.2. Tax Revenue Equation

A number of empirical studies have exploited the determinants of tax revenue in both developing and developed countries and several factors determining a country's taxable capacity have been identified in these studies. The determinants can be grouped into two categories:

- i. The level of development as measured by a country's real GDP.
- ii. The structure of the economy indexed by such characteristics as the degree of monetization as measured by percentage Monetary GDP, (MON); and openness of the economy (OE), measured by the ratio of the forex bureau rate to the Inter-Bank Foreign Exchange Market (IFEM) rate.

Government policies are also thought to influence tax revenue directly through a variety of ways, including the real value of the exchange rate RER.

We can then express the tax equation as:

$$\ln T = \tau_0 + \tau_1 \ln Y + \tau_2 \ln OE + \tau_3 \ln MON + \tau_4 \ln RER + U_4 \dots \dots \dots (9)$$

$$\tau_1, \tau_2, \tau_3 > 0; \quad \tau_4 < 0$$

The simultaneous behavioural equations are estimated using linear and non-linear 2SLS and 3SLS and other efficient estimation techniques.

Policy Simulations

Policy simulations are conducted to determine the impact of Terms of Trade (TOT) shocks and monetary shocks on the Real Exchange Rate path, RER, and the major building blocks of the macroeconomy. In addition, possible policy slippages, shocks and contagion effects can be reduced if macroeconomic policies within the region are harmonised and so this policy-oriented empirical model serves as an Early Warning System.

Empirical Results

Throughout the paper, empirical results in parentheses () are t-values, while those in square brackets [] are asymptotically exact probability values. Quarterly data for the sample period, calendar year 1987 Quarter 1 – calendar year 1998 Quarter 4, were analysed.

Real Exchange Rate (RER)

The real exchange rate equation, which was well behaved according to the diagnostic tests, was significantly affected by one-quarter lagged real exchange rates. It was marginally affected by the current terms of trade, and current and one-quarter lagged net capital flows during the sample period, June 1987 – June 1998. Although productivity, government expenditure and monetary shocks were clearly insignificant, their joint effect was significant and crucial in specifying a well-behaved functional form, as shown by the variable deletion test and functional specification tests, respectively.

$$\begin{aligned} LRER = & 1.535 + 0.514 LRER(-1) - 0.201 LTOT - 0.077 LTOT(-1) + 0.999 LKFLAWS \\ & (1.909) \quad (2.912) \quad (-1.365) \quad (-0.444) \quad (1.249) \\ & - 0.840 LKFLAWS(-1) - 0.077 LPROD + 0.026 LG - 0.053 LMONSHOCK \\ & (-1.115) \quad (-0.463) \quad (0.224) \quad (-0.185) \end{aligned}$$

R-Bar Squared = 0.770 F-Stat F(8,35) = 19.007[0.000] DW=1.403

Diagnostic tests:

- Serial Correlation CHI-SQ(4) = 3.773[0.438]
- Functional Form CHI-SQ(1) = 0.419[0.518]
- Normality CHI-SQ(2) = 0.388[0.823]
- Heteroskedasticity CHI-SQ(1) = 14.385[0.000]

Estimated Equilibrium Real Exchange Rate path (ERER)

The fitted trend of RER based on the fundamentals, without the insignificant monetary shock variable, estimates the ERER path. The results show that the Terms of Trade (LTOT) exerted significant appreciation pressures on the Equilibrium Real Exchange Rate (ERER), while net

capital flows and one-quarter lagged real exchange rates exerted significant depreciation pressures on the ERER. Government expenditure and the productivity proxy had no significant impact. All the signs were according to the economic prior beliefs discussed earlier, except for the net capital flows factor.

The trend of the RER fundamentals only which estimated the ERER was well specified and yielded the following results:

$$\begin{aligned} \text{LRER} = & 1.787 + 0.617 \text{LRER}(-1) - 0.161 \text{LTOT} + 0.115 \text{LKFLAWS} - 0.112 \text{LPROD} \\ & (3.107) \quad (4.986) \quad \quad \quad (-1.984) \quad \quad \quad (2.035) \quad \quad \quad (-0.813) \\ & - 0.013 \text{LG} \\ & \quad \quad \quad (-0.135) \end{aligned}$$

$$\text{R-Bar Squared} = 0.834 \quad \text{F-Stat } F(5,38) = 44.164[0.000] \quad \text{DW} = 1.769$$

$$\text{Serial Correlation} \quad \text{CHI-SQ}(4) = 8.379[0.079]$$

$$\text{Functional Specification} \quad \text{CHI-SQ}(1) = 0.306[0.580]$$

Real Exports (X)

Exports were positively and significantly affected by lagged export behaviour and the current performance of the real economy and were marginally increased by the terms of trade. The real exchange rate did not boost exports.

$$\begin{aligned} \text{LX} = & 1.606 + 0.437 \text{LX}(-1) + 0.233 \text{LTOT} + 0.009 \text{LRER} + 0.903 \text{LPROD} - 0.248 \\ & \text{LPROD}(-1) \\ & (1.679) \quad (2.669) \quad \quad \quad (1.652) \quad \quad \quad (0.065) \quad \quad \quad (2.422) \quad \quad \quad (-0.636) \end{aligned}$$

$$\text{R-Bar Squared} = 0.9209 \quad \text{F-Stat } F(5,38) = 101.175 [0.000] \quad \text{DW} = 2.048$$

Diagnostic tests:

$$\text{Serial Correlation} \quad \text{CHI-SQ}(4) = 7.790[0.100]$$

$$\text{Functional Form} \quad \text{CHI-SQ}(1) = 3.452[0.063]$$

$$\text{Normality} \quad \text{CHI-SQ}(2) = 1.940[0.000]$$

$$\text{Heteroskedasticity} \quad \text{CHI-SQ}(1) = 12.601[0.000]$$

Real Imports equation

Imports were influenced by lagged values of RER and Z. However, earlier studies (by Bank of Uganda, Research Department) using annual real GDP data derived import elasticities of about 1.12 and 1.17 for the short-run and long-run, respectively, which shows that the index of industrial production, PROD, may not an adequate proxy for real GDP or productivity. Experimentation with several lag structures to capture the adjustment process, after incorporating LG, yielded the following well-specified equation:

$$\begin{aligned} \text{LZ} = & -0.339 + 0.945 \text{LZ}(-1) + 0.356 \text{LRER} - 0.424 \text{LRER}(-1) + 0.416 \text{LPROD} - 0.467 \text{LPROD}(1) + \\ & .135 \text{LG} \\ & (-0.30) \quad (9.09) \quad \quad \quad (1.44) \quad \quad \quad (-1.97) \quad \quad \quad (0.47) \quad \quad \quad (-1.74) \end{aligned}$$

(1.69)

Adjusted R-squared = 0.95 F(6,37) = 164.89[0.00] DW = 2.23

Serial Correlation CHI-SQ(4) = 1.45[0.83]

Functional form CHI-SQ(1) = 2.40[0.12]

Normality CHI-SQ(2) = 0.43[0.80]

Heteroskedasticity CHI-SQ(1) = 0.75[0.38]

Real Government expenditure equation

Real government spending was significantly influenced by Donor budget support, Index of industrial production as a measure of productivity in the economy, annual headline annual inflation (INF), and tax revenue lagged by one quarter. The CUSUM test was particularly useful for detecting systematic changes in the regression coefficients.

Experimenting with lagged variables gave better results than the specified equation.

$LG = -3.3232 + 0.037LG(-1) - 0.495LRER(-1) + 0.626LT(-1) + 0.246LDBD + 0.523LPROD$

+

(-0.783) (0.298) (-1.018) (2.97) (2.31) (2.25)

3.34 INF

(2.09)

Adjusted R-squared = 0.75 F-Stat = 33.38[0.00] Durbin's h-stat -4.532[0.000]

Functional form = 0.601[0.441]

Normality CHI-SQ = 13.85[0.001]

Heteroskedasticity = 0.8879[0.35]

Real Tax equation

The results suggest that depreciation of RER reduces tax revenue with a lag. Real lagged imports and annual inflation affected the tax base marginally. An increase in the productivity measure LPROD increases tax revenue through the excise duties.

The real tax equation specified before required experimentation with various lag structures and deletion of the insignificant factor, the exchange rate premium as a measure of the 'Openness' (OE), gave better results reported below:

$LT = 9.1 + 0.285LT(-1) - 1.02LRER(-1) + 0.434LPROD + 0.065LZ(-1) - 0.41INF$

(3.24) (2.34) (-3.29) (3.39) (0.416) (-0.461)

Adjusted R-square = 0.87 F-stat = 85.4[0.00] Durbin's h-stat = -2.25[0.024]

Functional form F = 1.1834[0.281]

Heteroskedasticity F = 2.17[0.146]

VIII. Conclusion

The Real Exchange Rate fundamentals that map out the Equilibrium Real Exchange Rate path (ERER) and the departures of the actual Reserve Money path from desired Reserve Money Program path determine the behaviour of the actual Real Exchange Rate path (RER). Key current account, fiscal and real variables are also modelled and estimated using linear and non-

linear 2SLS and 3SLS. Policy simulations are conducted to determine the short- and long-run impact of monetary shocks and terms of trade shocks on the Real Exchange Rate path and on the major building blocks of the macroeconomy.

Uganda faces the current challenge of balancing multiple noble ultimate objectives of maintaining single-digit domestic inflation, achieving export sector competitiveness, building up gross and net international reserves, ensuring balance of payments sustainability, ensuring financial system and market stability, sustaining buoyant economic growth and eradicating poverty. This is indeed a delicate policy balancing approach that requires an additional matching array of instruments and programs, and financing. The Ugandan aggregate export sector marginally responded to the RER positively. A strategic and competitive export development and diversification policy and program needs to be designed, funded and pursued vigorously and efficiently.

There is also a link between fiscal sector developments and RER. Government spending did not significantly appreciate RER because government has been a net saver with the banking system since 1992/93 and as the burden of expenditure did not fall significantly on domestic price level (which is a denominator in RER), the real appreciation was reduced. Inflation has been totally subdued as a result of monetary and fiscal policy discipline. Some of the recent depreciation pressures on the RER may have reduced tax revenue because of the reduced demand for imports.

Strengthening of the linkages among monetary, fiscal, real and external sectors and development of a supportive road, energy and export infrastructure and an efficient financial system integrated with the informal financial sector will ensure that the economy remains on an even keel and prepare the Ugandan economy for the transition from stabilization to economic structural transformation, export- and investment- led growth, poverty reduction and human development.

On the macro policy front the following policies are recommended as a comprehensive package:

Departures of the actual Real Exchange Rate path (RER) from the Equilibrium Real Exchange Rate path (ERER) should be part and parcel of an early warning system.

Maintenance of export sector competitiveness through a competitive real exchange rate policy, human development, modernisation of industry and agriculture, trade reforms and supportive infrastructure for export-led development need to go beyond a track record of macroeconomic stabilisation to ensure economic structural transformation, poverty reduction and human development.

Reserve requirements on foreign exchange liabilities should not be lowered or should be lowered very slowly to manage the credit creation process generated by an increase in capital inflows.

Strengthen, deepen, broaden, integrate and develop the financial system and prudential guidelines to ensure an effective, dynamic and defensive monetary policy and efficient mobilisation and intermediation of resources.

There is a need for consolidating the gains from fiscal management to enhance efficiency from the external loans and grants. External grants and concessionary external loans sought by Government should be spent on increasing the total and marginal productivity of labour and capital to boost domestic investment in road, energy, social and export infrastructure and modernisation of agriculture and industry to sustain high real growth and deal a final fatal blow to poverty. The external funds should not be 100% sterilised. Macro-economic stabilisation is necessary but not sufficient to ensure both economic structural transformation and human development.

Although there is no need for capital controls in the new era of current account and capital account liberalisation, the recent financial crises in South East Asia and Russia and contagion in Brazil point to the urgent need for developing, and strengthening the supervision of, the financial system and its legislation.

Central Bank presence in the markets reduces panic and greed evidenced in widening margins.

Timely and adequate information dissemination to facilitate rational decision making on the part of market participants will immensely minimize panicky behaviour. An institutional framework is now in place for strengthening the policy interaction process, macroeconomic and sectoral linkages and the linkages between the formal and informal sectors, including a conducive environment for micro-finance, economic growth and poverty reduction.

Maintenance of an appropriate policy and institutional environment - strong macro-economic and legal frameworks; more open trade or commercial reforms; and introduction of well-serviced and viable regional Multi-Facility Economic Zones (MFEZs).

Emphasize regional policy harmonisation to substantially reduce regional policy slippages, contagion and other shocks to the macro economy and the region.

The target audience for this study has consisted, first and foremost, of officials of Bank of Uganda and Ministry of Finance, Planning and Economic Development. They have benefited from the policy-oriented empirical research through an improvement in their ability to formulate, conduct and anticipate the consequences of their foreign exchange market operations, domestic open market operations and other instruments of monetary policy on the major building blocks of the macroeconomy. In addition, other members of the banking and financial community have benefited from a clearer and more transparent understanding of how monetary, fiscal and exchange rate policies function in Uganda and the limitations of these policies. Furthermore, exporters and importers now understand better the movements of the nominal exchange rate in relation to changes in domestic prices and the implications of these movements for the profitability of their operations. Finally, the target audience has also included policy makers, the business community, journalists, academics, politicians and the general public who have gained a better perception of one of the crucial areas affecting Uganda's trade, growth and poverty eradication prospects, in general, and Uganda's export sector competitiveness, in particular.

References

- Abuka, C. A. and Sajjabi, M. D.** (1996) The importance of domestic and external factors in the appreciation of the real exchange rate in Uganda. Final Report presented at the AERC Workshop in Nairobi, May 25-30th.
- Asea, P. K. and Reinhart, C. M.** (1995) Real interest rate differentials and real exchange rate: Evidence from four African countries. A paper presented at the AERC Workshop, Nairobi, May 1995.
- Aghevi, B. B., Khan, M. S. and Montiel, P. J.** (1991) Exchange rate policy in developing countries: Some analytical issues, *IMF Occasional Paper* No. 78, March 1991.
- Calvo, G., Reinhart, C. M. and Vegh, C. A.** (1995) Targeting real exchange rate: Theory and evidence, *Journal of Development Economics*, Vol. 47, pp. 97-133.
- Canneti, E. and Greene, J.** (1991) Monetary growth and exchange rate as causes of inflation in African countries: An empirical analysis, IMF Working Paper, 91/676, Washington, DC.
- De Grauwe, P.** (1994) Exchange rates in search of fundamental variables, Centre for Economic Policy Research, Discussion Paper No. 1073, December, 1994.
- Dornbush, R.** (1976) The theory of flexible exchange rate regimes and macroeconomic policy, *Scandinavian Journal of Economics*, Vol. 78, No. 2, pp. 255-75.
- Dornbush, R.** (1982) PPP exchange rate rules and macroeconomic stability, *Journal of Political Economy*, Vol. 90, pp. 158-165.
- Dornbush, R.** (1988) *Exchange Rates and Inflation*, MIT Press.
- Edwards, S.** (1989) *Real Exchange Rates, Devaluation and Adjustment*, Cambridge, Massachusetts: MIT Press, London.
- Edwards, S.** (1993) Exchange rate as nominal anchors, *Weltwirtschaftliches Archiv*, Band 129, Heft 1.
- Edwards, S.** (1994) Real and monetary determinants of the real exchange rate behaviour: Theory and evidence from developing countries, in Williamson, J (ed), *Estimating Equilibrium Exchange Rates*, Institute of International Economics, Washington, DC.
- Edwards, S.** (1995) *Capital Controls Exchange Rates and Monetary Policy in the World Economy*, Cambridge University Press.
- Edwards, S.** (1996). A Tale of Two Crises: Chile and Mexico. *NBER Working Paper Series*. Working Paper 5794, Cambridge, and Anderson Graduate School of Management, UCLA, October.
- Edwards, S.** (1997). Exchange Rate Policy options for Emerging Economies, Anderson

Graduate School of Management, University of California at Los Angeles and NBER, August.

Eihenbaum, M. and Evans, C. (1993) Some empirical evidence on the effects of monetary policy shocks on exchange rates, *NBER Working Paper* No. 4271.

Elbadawi, I. A. (1989) Terms of trade, commercial policy, and the black market for foreign exchange: An empirical model of real exchange rate determination. Economic Growth Centre. Discussion Paper No. 570, Yale University.

Elbadawi, I. A. (1994) Estimating long-run equilibrium real exchange rates, in Williamson, J. (ed.) *Estimating Equilibrium Exchange Rates*, Institute of International Economics, Washington, DC.

Elbadawi, I. A. and Soto, R. (1994) Capital flows and long-term equilibrium real exchange rates in Chile, World Bank Policy Research Working Paper, No. 1306, June.

Faruqee, H. (1995) Long-run determinants of real exchange rate: A stock-flow perspectives, IMF Staff Papers, Vol 42, No. 1.

Fosu, K. Y. (1992) The real exchange rate and Ghana's agricultural exports. African Economic Research Consortium. Research Paper No. 9.

Hausman, R. and Gavin, M. (1995) Overcoming volatility in Latin America, Inter-American Bank (mimeo), August.

International Development Consultants (IDC) (1997) Comesa Cross Border Initiative (CBI), A Study proposal on exchange rate policy in Uganda as a possible Non-Tariff Barrier to Regional Trade Promotion, Kampala, Uganda, October.

Khan, M. S. and Lizondo, J. S. (1987) Devaluation, fiscal deficits and the real exchange rates, *World Bank Economic Review*, Vol. 1, pp. 357-374.

Khan, M. S. and Reinhart, C. M. (eds.) (1995) Capital flows in the APEC Region, *IMF Occasional Paper* No. 122, March.

Kiguel, M. A. (1992) Exchange rate policy, the real exchange rate, and inflation: Lessons from Latin America, World Bank Working Paper Series, No. 880, April.

Killick, T. and Mweya, F. M. (1989) Monetary policy in Kenya, 1967-88, ODI Working Paper No. 39.

Koen, V. and Meyermans, E. (1994) Exchange rate determinants in Russia: 1992-93. IMF Working Paper No. WP/94/66.

MEFMI (1999) *Macroeconomic Projections, MEFMI Regional Project*, Harare, September; and Dar-es-Salaam, November, 1999.

Musinguzi, P. (1991) A Model of Monetary Policy in Uganda. Ph.D Thesis, Department of

Economics, University of Southampton, U.K., June.

Musinguzi, P. (1996) Monetary policy objectives and conduct in Uganda. Paper presented at the XI East African Central Banking course, Hotel Saba Saba, Arusha, Tanzania, July.

Musinguzi, P. (1997) Promotion of Export Sector Competitiveness via the Equilibrium Real Exchange Rate. Uganda Vision 2025, Crested Crane Hotel, Jinja, September.

Musinguzi, P. and R. Rwekiza (1994) Unification of Foreign Exchange Markets and Achieving Currency Convertibility: The Case of Uganda. Paper Delivered At The PTA Bankers Association Workshop. Arusha, Tanzania.

Musinguzi, P. and Obwona, M. (1997) Monetary and Exchange Rate Policy in Uganda. USAID (EAGER) Novotel, Accra, March.

Musinguzi, P. and D. Kihangire (1994) Base Money, Growth, Inflation, Interest Rate and Exchange Rate Targeting: The Policy Dilemma. Research Abstract Papers, Bank of Uganda, Research Department.

Musinguzi, P. and E. Ochieng (1997) Exchange Rate Regimes in Uganda Technical Working Groups Cross-Border Initiative, October.

Musinguzi, P. (1994) The Instruments of Monetary Policy In the Framework of A Development Oriented Policy in Uganda. A Paper Presented At a Seminar on Development Oriented Economic Policy, Berlin, Frankfurt, Germany.

Musinguzi, P. and A. Mugume (1997) A Model of Uganda's Macroeconomic Linkages. Research Department, Bank of Uganda, October.

Musinguzi, P. (1998) Promotion of Uganda's Export Sector Competitiveness via the Equilibrium Real Exchange Rate Path. Uganda Vision 2025, August.

Musinguzi, P. and Smith, P. (1998) Structural Adjustment and Poverty: A Study of Rural Uganda. Discussion Papers in Economics and Econometrics, No. 9813, Department of Economics, University of Southampton, August.

Musinguzi P. and Obwona, M. (1998) Savings Mobilisation and Credit Conduits: Formal and Informal Financial Sector Linkages Research Series No. 5, Economic Policy Research Centre, Makerere University Campus, January.

Musinguzi, P. (1999) Human resource person at the East African Cooperation Ministerial Seminar to present a paper on Harmonisation of Fiscal, Monetary and Exchange rate policies under the East African Cooperation Arrangement, EAC Secretariat, Arusha, March 25-26, 1999.

Musinguzi, P. (1999) Discussion Paper presented at the UNDP Launching of the Global Human Development Report under the Theme: Globalisation with a Human Face; UNDP, July 12, 1999, Sheraton Hotel, Kampala

Musinguzi, P., Kihangire, D., Atingi, M., Abuka, C., Dhatemwa, G., Musisi, A., and Mukasa, E. (1999) *Macroeconomic Projections for Uganda, MEFMI Regional Project*, Harare, September Dar-es-Salaam, November, 1999.

Musinguzi, P. (1999) *UNDP/ILO IPRE Study: Financial and Banking System in Uganda*, September-December, 1999.

Ndung'u, N. S. (1995) Price and exchange rate dynamics in Kenya: An empirical investigation 1970-1993, *AERC Discussion Paper*.

Ndung'u, N. S. (1996) Monetary and exchange rate policy in Kenya, Final Report, *AERC Workshop*, Nairobi, November/December.

Schadler, S. Carkovic, M. Bennet, A. and Khan, R. (1993) recent experiences with surges in capital inflows, *IMF Occasional Paper*, No. 108, December.

Smith, P. (1998) Should Africa try to learn from Asia? Lessons for and from Uganda. *Discussion Papers in Economics and Econometrics*, No. 9814, Department of Economics, University of Southampton, August.

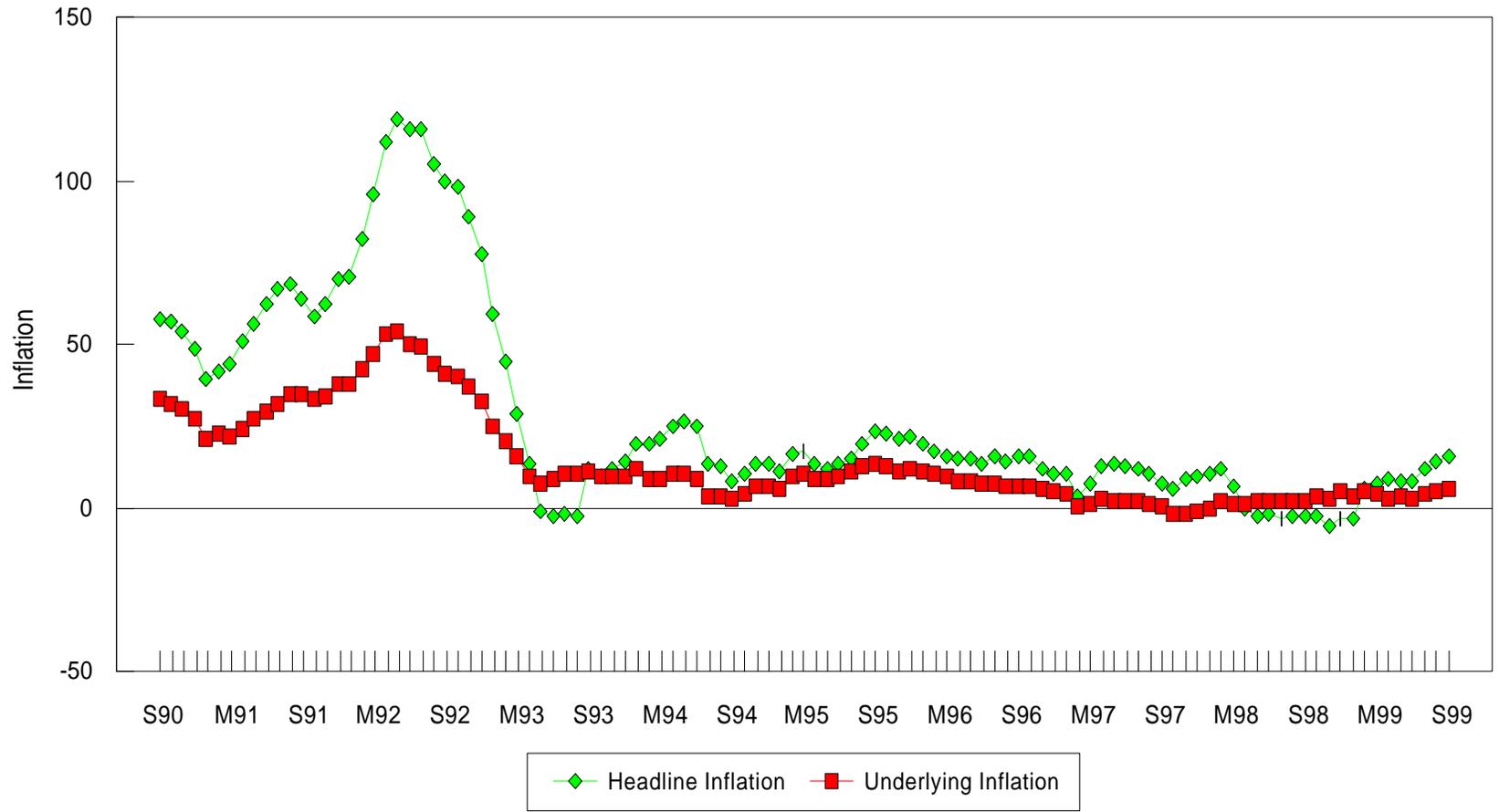
Stryker, D. and C. Jebuni (1999) Ghana Monetary and Exchange Rate Policy, USAID EAGER/TRADE, AIRD, Cambridge, Mass., and CEPA, Accra, April.

UNDP (1998) Human Development Report.

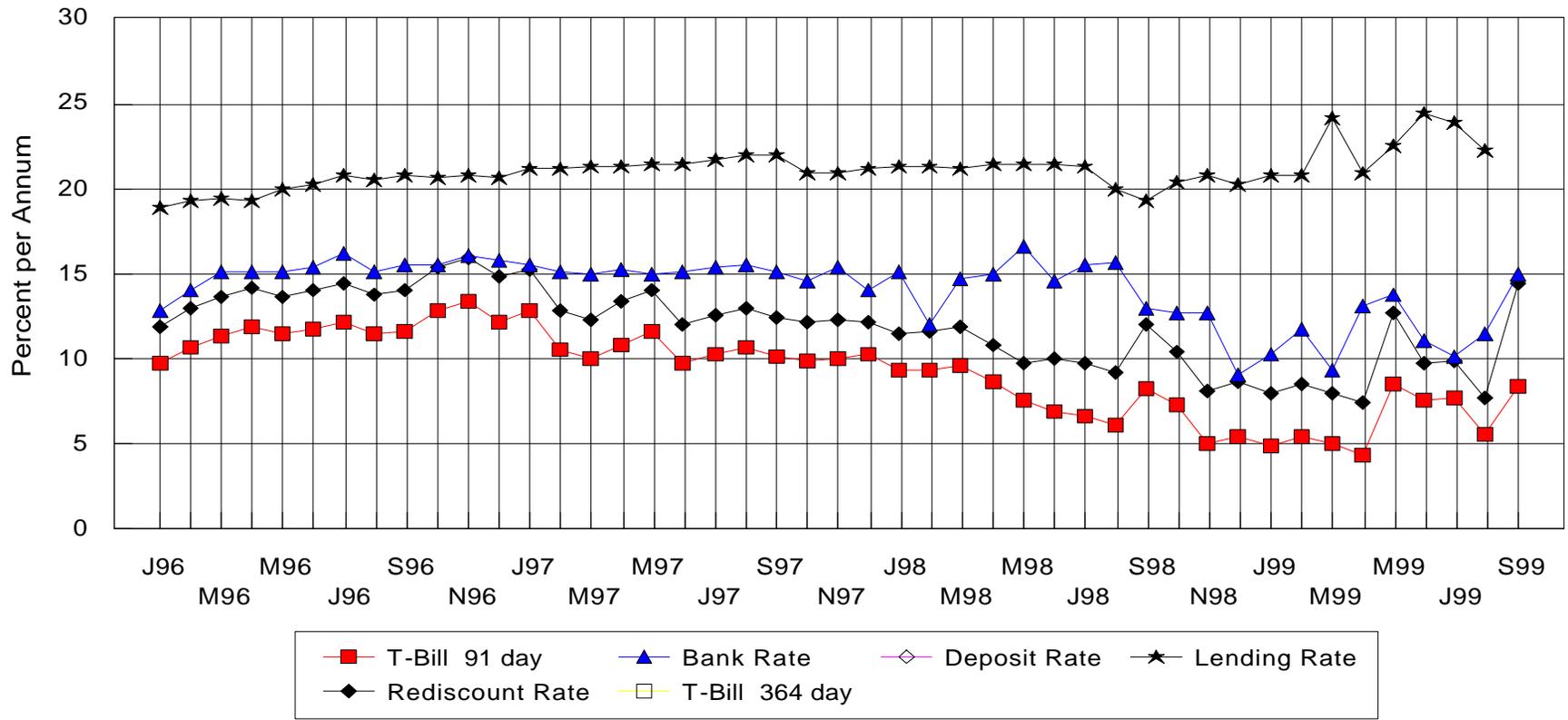
World Bank (1984) Towards Sustained Development in Sub-Saharan Africa. Washington, DC.

Price Developments

Underlying and Headline Inflation



Nominal Interest Rates



Interbank Foreign Exchange Market

Exchange Rates and Spread

