

THE CONDUCT OF MONETARY POLICY IN UGANDA

AN ASSESSMENT

CHRISTOPHER ADAM*

UNIVERSITY OF OXFORD, UK

OCTOBER 2008

REVISED JUNE 2009

This paper was written for the Economic Policy Research Centre, Kampala. I am grateful to the EPRC Director, Sarah Ssewanyana and to Laurence Bategeka, Winnie Nabiddo and Evarist Twimukye for their support and discussions during my visits to Kampala in May 2008. I am also grateful to the numerous people at the Bank of Uganda and the Ministry of Finance and Economic Development who gave freely and generously of their time to discuss the issues in this paper. Some of the ideas in this paper were presented at a seminar at the Hotel Africana, Kampala on 8 July 2008. The revised version of this paper includes responses to a thoughtful review from the Monetary and Credit Policy Committee of the Bank of Uganda. All opinions expressed in this paper are my own and not those of the EPRC. Errors of fact and interpretation claim the same provenance.

Email: christopher.adam@economics.ox.ac.uk

TABLE OF CONTENTS

Executive Summary and Outline3

I. Recent monetary conditions and the cost of monetary policy5

II. Inflation control and the reserve money programming 15

III. External Shocks, portfolio flows and bond sterilization..... 24

IV. Is there a case for capital controls?..... 32

V. Transition to Inflation Targeting 34

References.....44

EXECUTIVE SUMMARY AND OUTLINE

In this paper I discuss aspects of the conduct of monetary policy in Uganda. The starting point is the perception held by some that while Uganda has been amongst the most consistently successful countries in Africa in controlling inflation since the early 1990s, this has come at a high fiscal cost and that the conduct of monetary policy has stifled rather than encouraged the development of the financial sector.

Recently, these concerns have been compounded by a growing feeling that the monetary regime that has for so long served Uganda well – the reserve money framework -- is proving less successful in delivering low and stable inflation as the capital account has becomes more open.

I argue that while some aspects of this critique are valid they need to be put in context. Depending on the counterfactual used, the cost of conducting monetary policy in Uganda may be relatively high and certainly at times in the recent past it has probably been inefficiently so. But to a significant degree these high costs reflect the structural characteristics of the Ugandan economy. The small size of the economy and its asset markets, is historical legacy, including near-hyper inflation and an almost complete demonetization in the late 1980s, and the nature of the external shocks to which the economy is exposed, places particular pressures on the monetary authorities and entails generally higher interest rate and exchange rate volatility than might otherwise be the case.

These features will take some time to unwind. More can be achieved in the short-run in terms of reviewing the stance of policy, however. There is little doubt that the conduct of monetary policy in response to the surge in aid and private capital flows around the turn of the century probably exacerbated exchange rate and interest rate volatility, to the detriment of the economy. This, I argue, can be traced to fundamental difficulties associated with operating a reserve money programme in the face of an open and volatile capital account. However, recent modifications to the Bank of Uganda's operating procedures have very significantly improved the conduct of monetary policy.

The strong current inflationary pressures are predominantly but not exclusively driven by supply side factors including the global surge in food and fuel prices. Nonetheless, since these are likely to be reasonably persistent there may be a case for some tightening of the monetary stance to bring inflation back towards its target. This may entail a slightly more appreciated exchange rate and/or higher domestic interest rates. How tight this squeeze needs to be will depend on the Bank's views about their persistence of the supply shocks, which in turn depend on how the current credit crisis in industrialized economies impacts on global aggregate demand, and its assessment about the speed and magnitude of the supply-side response to the ongoing investment boom in Uganda.

Notwithstanding these recent developments, I take the view that while there is certainly scope for refinement and modification – for example more may still need to be done to establish a more flexible approach to policy on bond sterilization and there is a strong case for greater coordination between the Ministry of Finance and Economic

Development and the Bank of Uganda on managing the quasi-fiscal costs of liquidity generation -- there is no strong case for a radical re-orientation of the conduct of monetary policy in Uganda in the short run. I also take the view that there is at best only a weak case for considering the taxation of private capital flows in the short run: significant investment in systems is still required before a credible regime could be put in place.

In the medium term, however, it is likely that more radical modifications to the monetary framework will be called for. Intellectual perspectives on the conduct of monetary policy in Africa are changing, with an increasing number of countries on the continent actively considering anchoring their monetary policy in explicit inflation targeting (IT) regimes, following the lead of South Africa and Ghana. The debate on the merits of inflation targeting has started to emerge in official circles in Uganda and has featured in discussions on monetary and fiscal policy harmonization in the East African Community. The intellectual case for inflation targeting is compelling and the experience of the first wave of IT countries – at least up to around 2007 – lends empirical support for a shift towards full-fledged inflation targeting.

It does not follow, however, that IT can or should be implemented either quickly or in the same form as elsewhere. In the second part of this paper I outline the key characteristics of an inflation targeting regime and discuss a number of issues for consideration were Uganda to chose to move towards a formal inflation targeting regime. Priority areas in this respect include: the extent to which inflation targeting needs to be buttressed by fiscal rules; how the authorities can reconcile legitimate competing objectives, especially over the exchange rate, with a credible commitment to an inflation target; and what instruments to employ in pursuit of an inflation target when financial markets are relatively underdeveloped.

The issues discussed here in the context of inflation targeting are no less relevant to the efficient functioning of the current monetary regime and as such they define a set of research priorities for the Bank of Uganda and for other agencies in the country. I see three areas as being of particular importance. The first concerns the transmission mechanism of monetary policy and how this is likely to evolve as financial markets develop. The second, which derives from the first, is the development of an operational model for forecasting inflation and, as a by product, the information demands this imposes on the statistical authorities in the country. The final area concerns the development of structures to communicate and inform the public on monetary policy choices.

The remainder of the paper consists of five sections. Section I reviews recent monetary conditions and addresses the issue of how the cost of monetary policy can be measured. Sections II and III represent the core of the paper and examine why the reserve money programme has become less effective over time as the capital account has become more open and how this weakness might be addressed. Section IV briefly discusses the question of the taxation of capital flows and Section V concludes with a discussion of the transition towards inflation targeting in Uganda.

I. RECENT MONETARY CONDITIONS AND THE COST OF MONETARY POLICY

Uganda's reputation for sound macroeconomic management is founded on a credible commitment to low and stable inflation. Core inflation declined steadily from 1992, dipped below 10 percent per annum in the first quarter of 1996, and until May 2008 averaged less than 5 percent per annum. Headline inflation has been somewhat more volatile but it too has been low and relatively stable over the same period.¹ Even allowing for the 'great moderation' in world inflation over this period, inflation in Uganda has been consistently lower than in virtually every African country outside the CFA zone and South Africa. This impressive record has been anchored in a relentless adherence to a tight reserve money programme, heavily buttressed by the cash-budget fiscal rule. In recent years, however, concerns have been raised about the continued efficacy of the reserve money programme. On the one hand, it would appear that the programme may be becoming less successful at anchoring inflation and on the other, that its operation has led to high domestic interest rates and has stifled both the lending activities of the banking system and the development of an effective interest rate channel of monetary policy transmission.

In Sections II and III of this paper we examine why the reserve money programme has encountered difficulties and examine how this framework might be modified. In doing so we focus quite narrowly on the conduct of monetary policy itself and in particular on the question of the appropriate degree of exchange rate intervention (and sterilization) in the face of external shocks inducing shifts in the private sector's asset demands. Before turning to these policy issues we consider first the question of measuring the cost of monetary policy.

The 'cost' of monetary policy

Any discussion of the cost of monetary policy requires a clear articulation of the counterfactual. This is difficult to establish for a number of reasons. A natural starting point would be to compare the performance of the current regime against other potential regimes for the country or, more commonly, against other countries. But these simple comparisons face problems. To evaluate actual and counterfactual behaviour we must have an idea of both the objective function of the authorities and the nature of the shocks to which the authorities must react. Both are, however unobservable. We may attempt to control for these factors by assuming that countries similar in other observable ways face similar shocks and have similar preferences: hence a regional comparison may be most appropriate. This is where we start: later in Section II we rely more heavily on formal simulation models which make explicit both preferences and shocks.

¹ Between 1996 and May 2008, core inflation averaged 4.4percent per annum with a standard deviation of 2.2percent per month. Over the same period, headline inflation averaged 5.1percent with a monthly standard deviation of 4.1percent per month.

The conventional text-book treatment of the cost of monetary policy distinguishes between two related notions. The first is the idea of the ‘sacrifice ratio’ which is defined as the cumulative loss of output, expressed as a percentage of current GDP, associated with a one percentage point reduction in trend inflation. The sacrifice ratio emerges directly from the short-run Phillips curve. Inverting the Phillips curve we obtain

$$(1) \quad (y_t - y_t^*) = \alpha(\pi_t - \pi_{t-1}) + u_t$$

where y denotes output, y_t^* is potential output and π_t inflation. The parameter $\alpha > 0$ determines the size of the sacrifice ratio. The larger is α the higher the output cost of disinflation.² The sacrifice ratio is either estimated from time-series VAR models or through detailed analysis of specific deflationary episodes.

The concept of the sacrifice ratio really only makes sense in a stationary environment, however, in which output is close to its potential and inflation is driven principally by the authorities’ demand-side policy actions. This does not describe Uganda in recent years. Over the decade or so from 1996, Uganda has followed what is better described as a ‘post-stabilization’ path in which, as a result of policy reforms, resource inflows and structural transformation, the economy has seen a significant increase in trend output which has gone hand in hand with a steady recovery in the demand for money. At the same time, real import costs have fallen substantially as a result of the re-integration of China into the world economy, supporting the ‘great inflation moderation’ that continued through to the end of 2006. As a result, trend and actual output and inflation in Uganda have been negatively correlated. Using this standard approach, then, there has been no sacrifice, no trade-off between output growth and inflation.

The second notion of the cost is a fiscal or quasi-fiscal one, namely: what are the resource costs of conducting an independent monetary policy? In Uganda, this discussion has tended to focus very narrowly on the size of domestic interest costs charged to the government budget which, over the last decade domestic have risen sharply, from around 0.3 percent of GDP in the second half of the 1990s (or 3 percent of domestic revenue) to approximately 0.9 percent of GDP in 2006/07 and are projected to be marginally higher in 2007/08, equivalent to around 7 percent of total government expenditure.³

This sharp rise reflects both an increase in the debt stock and in real interest rates. The outstanding gross stock of domestic debt has risen from 2 percent of GDP in 1995 to 4 percent of GDP in 2000 and to almost 9 percent of GDP in 2005/06 (see Figure 1). Estimates for 2007/08 put the total debt stock at around 11 percent of GDP.⁴ At the same time, high debt service costs also reflect high interest rates on debt (Figures 2 and 3). Nominal 91-day Treasury Bill rates have fallen, particularly since the early 2000s, but as Figure 3 makes clear domestic interest rates still remain substantially above

² Some analyses of the sacrifice ratio allow for the estimated size of α to vary between increases in inflation and decreases; it is the latter than matters for the sacrifice ratio.

³ Christensen (2004) and IMF (2008a, 2008b).

⁴ IMF (2008b).

comparable US government bill rates, more so once exchange rate differentials are counted; domestic interest rates are approximately 7 percent per annum above world rates.⁵

Interest on public debt currently accounts for around 1 percent of GDP or around 10 percent of government revenue before grants. This is a broadly similar burden to that faced by neighbouring countries (in Tanzania the figures are almost identical, while in Kenya interest costs are around 2 percent of GDP but domestic revenue is also higher, around 22% of GDP). By this measure of the counterfactual, Uganda is not severely out of line with natural comparators. This is an incomplete picture, however, since the gross debt stock is more than offset by government deposits with the banking system. By the end of 2007, for example, the outstanding stock of domestic debt held by the monetary system was around 6.5 percent of GDP but government deposits with financial institutions stood at close to 9.6 percent of GDP (see Figure 1). While fiscal projections anticipate government becoming a net debtor to the financial system in the next few years the essential tension remains: government is concerned that despite running positive net fiscal balance (and indeed a large primary surplus net of aid), it is still paying almost 10 percent of its income in interest costs on public domestic debt.

⁵ The nominal differential in Figure 3 is calculated as $i_t^d - i_t^f$ where i_t^d and i_t^f denotes the annual interest rate on Ugandan and US 3-month treasury bills. The exchange rate adjusted differential is derived from the uncovered interest parity or no-arbitrage condition $i_t^d = i_t^f + E_t \dot{e}_t$, which states that for an equivalent asset risk and maturity, domestic interest rates will equal foreign rates adjusted for the expected depreciation of the exchange rate over the holding period. The exchange rate adjusted differential is therefore $i_t^d - i_t^f - E_t \dot{e}_t$. Hence if asset holders expect the exchange rate to appreciate they should be prepared to accept a lower domestic interest so that the differential increases.

Box 1. The consolidated public sector budget constraint

Macroeconomic management is the responsibility of the public sector. It therefore makes sense to start with the budget constraints of the government and the central bank. We shall consider two alternative cases, the first where the only interest bearing securities are the liabilities of government (even though decisions over their management is vested in the central bank) and the second where the central bank issues its own liabilities (backed implicitly by its capital).

In the former case, the government's budget constraint is defined

$$(2) \quad G_T + i_t B_{t-1}^G + E_t i_t^f F_{t-1} - T_t - S_t = \Delta DC_t^G + \Delta B_t^G + E_t \Delta F_t + E_t A_t.$$

Total government expenditure is the sum of non-interest expenditure, G , and interest payments on domestic and foreign debt, ($i_t B_{t-1}$ and $E_t i_t^f F_{t-1}$ respectively, where E is the nominal exchange rate). Total domestic revenues are defined as the sum of conventional revenues (T) plus any transfer out of profits from the central bank (denoted S). The difference is covered by a combination of domestic financing, foreign financing and grants. Domestic financing is defined as the sum of domestic credit from the central bank plus borrowing from the banking system. For PRGF countries such as Uganda, virtually all foreign financing is on concessional terms so for convenience we can define

$\tilde{A}_t = (E_t \Delta F_t + E_t A_t - E_t i_t^f F_{t-1})$ as net foreign financing of the budget, allowing us to re-write the government budget constraint in terms of its domestic financing consequences as

$$(3) \quad DF_t = \Delta DC_t^G + \Delta B_t^G = (G_T + i_t B_{t-1} - T_t) - S_t - \tilde{A}_t.$$

The domestic financing requirement is equal to the fiscal deficit inclusive of domestic interest costs less net foreign financing and the profit remittances from the central bank. Domestic financing consists of ΔDC_t^G , the net increase in central bank claims on the government and ΔB_t^G , the net claims of deposit money banks and other entities.

The central bank's own budget constraint states that any net acquisition of domestic assets or international reserves must be financed either by its own net income or by an expansion in the monetary base, H less profits remitted to government.

$$(4) \quad \Delta NDA_t + \Delta NIR_t = \Delta H_t - S_t$$

We have assumed for simplicity that the central bank transfers its entire net profits, S , to the government. The central bank's net profit is measured in cash-flow terms and consists of its net operating income which, in turn, consists of gross income, principally interest income on foreign assets less operating costs.

[Box 1 continued]

In terms of the underlying assets we need to distinguish between the accumulation of foreign assets and valuation changes arising from movements in the exchange rate since only the former constitutes the asset counterpart to monetary base. Thus letting $\Delta NIR_t = E_t \Delta z_t + \Delta E_t z_{t-1}$ and noting that $H_t = \Delta NDA_t + E_t \Delta z_t$, we rewrite (4) as

$$(5) \quad \Delta H_t = \Delta DC_t^G + E_t \Delta z_t - S_t - \Delta NW_t$$

where ΔNW_t the change in the net worth of the central bank arising from exchange rate revaluation of net foreign assets.^[*]

While the monetization of fiscal deficits – the ΔDC_t^G term – constitutes the main link between fiscal and monetary policy, equations (2) and (5) bring out the central bank's own financial position, summarized by its net profit which is transferred to government.

Clearly, this transfer washes out when we consolidate the government with the central bank. Combining (2) and (5), and letting $Pdef_t = (G_t - T_t)$ be the primary budget deficit excluding transfers from the central bank, we get the consolidated budget constraint of the public sector,

$$(6) \quad \Delta H_t + \Delta B_t^G - E_t \Delta z_t = Pdef_t + i_t B_{t-1}^G - \tilde{A}_t - \Delta NW_t$$

Ignoring the final net worth term, this states that the overall fiscal deficit net of aid *regardless of on which institution's budget interest costs appear* is ultimately financed through some combination of seigniorage (defined here as growth in the monetary base), growth in domestic public sector debt, and depletion of international reserves

[*] Revaluation effects represent unrealized capital gains or losses. In contrast to realized exchange rate gains or losses that would arise, for example, if the Bank purchased foreign exchange at the market rate and sold it to preferred customers at a below-market rate, unrealized capital gains and losses do not have an immediate budgetary impact. However, to the extent that cumulative exchange rate revaluation losses represent a de-capitalization of the central bank., there will ultimately be a budgetary consequence as and when the central bank requires capitalization.

High interest costs: structure, policy choices and policy co-ordination.

The persistence of high interest rates in Uganda can be explained by at least two sets of factors: the structural characteristics of underdeveloped financial markets that both underpin substantial premia in asset prices and also sustain the monopoly power of established commercial banks; and choices by the central bank over the deployment of the instruments of policy.

Asset markets in Uganda are small, both in absolute terms and relative to the economy as a whole, and trade is thin. Honohan and Beck (2007) report that while the mean M3/GDP ratio for Africa in 2004-05 was 32 percent, that for Uganda was only 19 percent. The averages for Sub-Saharan Africa as a whole are low. The corresponding figure for South Asia is 50 percent of GDP while that for industrialized economies typically exceeds 100 percent. Not only is the financial sector small it is poorly diversified: the economic fortunes of both depositors and borrowers are highly correlated, leaving limited scope for banks to hedge their asset books. With the addition of weak legal structures for dispute settlement and a relatively underdeveloped capacity of markets to value assets and risk, this means that asset prices in Uganda embody a substantial liquidity premium.

In addition, the banking sector itself is highly concentrated – the three largest banks account for approximately 70 percent of the total financial assets under management. Combined with the illiquidity in the market, this high concentration sustains wide net interest margins and relatively low lending to the private sector. The net interest margin in Uganda averaged around 1400 basis points in 2004-05, which was substantially larger than in other African countries (where the average is around 800 basis points) and the rest of the world, where the margin was around 400 basis points.⁶ As a consequence, Ugandan banks have done relatively little intermediation: credit extended to the private sector by the banking system is remarkably low at around 11 percent of GDP, compared to an African average of around 20 percent (and an average for all developing countries of around 30 percent).⁷

Although these indicators suggest a highly monopolistic and rather dysfunctional banking system, changes in recent years which have included liberalization in the banking sector and the emergence of new South African banks in Uganda, suggest reform measures are gaining some traction. Though still low, lending has increased very substantially, rising from a meagre 1.5 percent of GDP in the mid-1990s to its current level of around 11 percent. (The current average for Sub-Saharan Africa as a whole is 36 percent and around 20% for low-income SSA countries)⁸. At the same time broader indicators of financial innovation, access and competition have moved in a positive direction (see Honohan and Beck, 2007).

These movements are obviously welcome but structures change slowly. But the overall level of domestic interest rates may also reflect the operation of monetary policy. In circumstances where domestic interest rates are not firmly tied to world rates, a tight monetary stance will drive domestic rates above their long-run (structural) values and possibly for extended periods of time. The *prima facie* evidence from Figure 3 suggests this has happened on a number of occasions in recent years in Uganda.⁹ High interest rates could, of course, represent the optimal response to various shocks, but as the analysis in Sections II and III suggests, these deviations can more readily be explained

⁶ Honohan and Beck (2007).

⁷ *Ibid.* and IMF Regional Economic Outlook: Sub-Saharan Africa (April 2009).

⁸ IMF Regional Economic Outlook: Sub-Saharan Africa (April 2009).

⁹ In the case where cross-border capital flows tie domestic interest rates closely to world rates, a tight monetary policy will be reflected in rising debt volumes.

directly in terms of policy choices emerging from the inflexible adherence to the reserve money programme.

The consolidated accounts of the public sector

Policy choices may also affect interest rates through an alternative channel if, for a given planned monetary stance, the monetary authorities deploy an inefficient mix of instruments. One potential source of inefficiency is if there are conflicts of interest between the central bank and government over the allocation of the quasi-fiscal costs and revenues arising from the conduct of an independent monetary policy.¹⁰

Cast in this light, domestic interest costs are only a partial measure of the 'cost of monetary policy', however. They measure only one element in the net monetary transactions -- i.e. those costs that appear on the government budget. But price stability is a public good and hence the correct way to measure the cost of supplying this public good, through monetary policy, is from the perspective of the consolidated accounts of the public sector, in other words the accounts of the central bank and government taken together.

How large are these costs?

In most industrialized countries central banks typically carry out their tightly prescribed (monetary policy) tasks at relatively low net cost, at least in 'normal times'.¹¹ Central banks are comparatively small institutions capable of financing their operations, including the cost of conducting monetary policy, through seigniorage revenue plus other means (for example, they can earn income by making better-than-market spreads on taking reserve deposits at just below market rates and making placements at market rates).

Given their tendency to engage in a wider range of quasi-fiscal activities, central banks in developing countries, however, have tended to either make very large profits for government (for example through the operation of dual exchange rate regimes of the type operated in Uganda and elsewhere in Africa during the 1980s) or accumulate large quasi-fiscal losses, as in Zimbabwe where the central bank's quasi-fiscal losses in 2006 were estimated to be equivalent to 75 percent of GDP (Munoz, 2007).

¹⁰ The quasi-fiscal operations of the central bank are those activities that can, in principle, be duplicated by direct budgetary measures in the form of an explicit tax, subsidy or direct expenditure and that has or may have an impact on the financial operations of the central bank or government (Mackenzie and Stella, 1996). This definition includes both the egregious quasi-fiscal activities (subsidized credit to favoured sectors, preferential exchange rates, forward cover at non-market rates etc) but also the 'regular' operations such as sterilization and other open market operations using public sector liabilities.

¹¹ In this discussion, and despite being widely used in OECD economies at the present time, I ignore the exceptional costs of addressing liquidity and solvency crises through bail-outs or other major liquidity injections by the central bank into the financial system.

Table 1: The cost of monetary policy

	Percent of GDP	
	2006/07	2007/08
Bank of Uganda		
Net Operating Income [1]	0.65%	0.90%
o/w Gross interest income on official reserves [2]	0.55%	0.78%
Government of Uganda		
Direct budgetary costs [interest paid on domestic debt]	0.88%	1.20%
Gross (cost) /Revenue of monetary policy excl. seigniorage	(0.23%)	(0.30%)
Seigniorage revenue [3]	1.02%	1.02%
Net (cost) revenue of monetary policy	0.79%	0.72%
BoU dividend to government	-	0.16%

Source: IMF (2008a); Bank of Uganda Annual Report 2007/08.

Notes: [1] Excludes unrealized capital gains / losses on revaluation of foreign exchange reserves. In 2006/07 these were equivalent to a loss of 1.26percent of GDP in 2006/07 and a gain of 0.41% in 2007/08.[2] Gross income is dominated by interest income on foreign exchange reserves. [3] The real value

of seigniorage is defined as $\Delta m_t + m_{t-1} \left(\frac{\pi_t + g_t + \pi_t g_t}{(1 + \pi_t)(1 + g_t)} \right)$ where m denotes real reserve money, g the

growth in GDP and π_t is the rate of inflation. The first term denotes the growth in real demand for base money and the second, ‘inflation tax’. We assume this accrues to the Bank of Uganda

The picture for contemporary Uganda highlights the tension between the central bank and government. As Table 1, based on data from the 2007/08 Annual Report of the Bank of Uganda, suggests, excluding *unrealized* capital gains or losses arising from the revaluation of net foreign assets, the net cost of conducting monetary operations to the consolidated public sector is around 0.23 percent of GDP, remarkably similar to the industrialized economy benchmark. Adding back the revenue from seigniorage, which is approximately 1 percent of GDP per annum, we find that from a simple net revenue perspective, the operation of an independent monetary policy generates a revenue flow to the consolidated budget of approximately 0.75% of GDP per annum, excluding capital gains or losses on revaluation.

However, the disposition of this income is markedly different. While the Bank of Uganda made a small operating profit in 2006/07 and 2008/09, principally from foreign interest income, the government incurred a substantial ‘loss’ in terms of interest costs borne by the budget. This imbalance is at the heart of tensions over the cost of monetary policy.

Coordination and the financial strength of the central bank

The presentation of the consolidated public sector budget constraint in Box 1 shows that, from the perspective of the public sector as a whole, the distribution of the costs of conducting monetary policy between government and the central bank should be irrelevant and should not be a determining factor in the central banks' operational decisions.

The analysis in Box 1 also shows why neutrality may not prevail. If the financial resources controlled by the central bank and /or government affect the instruments the bank can choose to deploy, or if they affect the leverage it brings to the policy process, then the disposition of resources between the central bank and government is not necessarily innocuous. For example, consider a situation in which government seeks to retire a substantial portion of domestic credit outstanding. A side effect of this – if the central bank charges interest on government's overdraft -- is to reduce central bank interest income. If it is concerned about its own bottom line, rather than that of the consolidated public sector, the central bank may now face incentives to accumulate interest-earning international reserves (and at the same time use government securities to sterilize the consequent liquidity injection) at a significantly higher rate than would be indicated by monetary and exchange rate targets alone. If, as is likely, domestic interest rates exceed those on foreign assets, the consolidated account suffers a loss, even though the transactions provide support to the income base of the central bank.

A central banks' function is to trade in domestic and foreign assets to achieve specified policy goals rather than to maximize revenues. With the capacity to issue domestic currency, it can continue to operate at a loss and, indeed, with negative net worth (i.e. accumulated losses) as long as the market continues to regard its liabilities as secure. With government standing behind it, central bank paper usually attracts the country's sovereign rating. However concerns about its own bottom line are relevant in order to ensure that *de jure* independence they may enjoy is reinforced by a degree of financial independence from government. The bank's policy credibility will be reinforced if market participants believe it will act according to its mandate and not be constrained to follow the not necessarily coincident interests of government.

During the 1970s and 80s central banks across Africa made substantial profits through large quasi-rents arising from financial repression and dual exchange rate regimes. The processes of financial and exchange rate liberalization since the early 1990s has, however, squeezed these profits and fuelled tensions between them and governments over the allocation of the costs of conducting monetary policy. Ironically, this squeeze on profits has been exacerbated in recent years by macroeconomic success which has seen a decline in governments' domestic borrowing requirements, lower inflation and lower seigniorage revenue. It has been further aggravated by the decline in interest rates earned on foreign reserves, particularly dollar-denominated assets.

So, if the financial independence of the central bank is a public good, its financing should presumably be undertaken by the whole public sector. Ideally, the central bank would have sufficient financial strength to ensure that it can execute monetary policy under a range of conditions without resorting to measures inconsistent with its policy mandate (Stella, 2008).

In Uganda, one option is clearly the *status quo*. From the government's perspective this may be unattractive for two reasons. The first is that this may create the incentive for the Bank to lean more heavily on bond sterilization that would otherwise be the case. The second is that such a mechanism may weaken incentives for the Bank of Uganda to control operating expenses. An alternative of placing a limit on the volume of government debt the central bank could issue, so as to limit the recurrent cost to government is equally unattractive.

By far the most attractive option would be for the central bank to issue its own interest bearing liabilities for the purpose of conducting monetary policy. This would entail treating interest costs on domestic debt as a direct charge against the central bank's gross income. As Table 1 indicates, in recent years the Bank of Uganda has made a small profit but there is no guarantee that this will persist. Indeed, given the current structure of rates, the Bank would make a loss at the margin for every dollar of foreign exchange reserve accumulation funded by domestic borrowing. While these losses are currently more than offset by the income from seigniorage, this is not inevitable.

From a monetary policy perspective, the most important determinant of whether the capital base is sufficient is whether the Bank of Uganda can issue paper that is perceived to be genuinely 'gilt-edged' and invulnerable to nominal default risk. This is more than ensuring that any given stock of debt could be honoured; it requires that the private sector believe that the central bank has the operational independence to employ its instruments so as to credibly achieve its monetary policy objectives, both now and in the future.

Ensuring that the central bank has sufficient resources at its back could be achieved through modifications in the Bank's operating regulations and/or an explicit subvention or through capitalization. A subvention mechanism, which would most likely entail a statutory call on the government budget, suffers from the same incentive problems as currently exist by drawing the Bank into repeated engagement with government over funding and thereby risking market perceptions of the central bank's *de facto* independence.

This leaves the option of 'one-off' re-capitalizing the central bank in order to provide an on-going income stream sufficient to allow it to pursue its policy mandate unhindered by concerns about its own net income position. Recapitalization entails engineering an internal fiscal capital transfer or pre-empting part of the external surplus. Neither are simple: On the internal side, the most straightforward is through a transfer from government of interest bearing assets which could be claims on the public or private institutions. They could be equities or bonds. On the external side they could be a transfer of the net foreign asset position of the economy to the central bank. Stella (2008)

describes a number of such transfer mechanisms, ranging from the transfer of oil revenues in the case of Norway to a series of tranching budgetary releases by parliament to the Central Bank of Chile. In both cases, these transfers were invested by the relevant central bank to generate an income stream.

Such options do not readily exist in Uganda at present. Domestic bond and equity markets are probably not deep enough at present to undertake an internal transfer.. On the external side, there is no trade surplus before aid to pre-empt (the prospect of re-capitalization through oil revenues is at best a long way off) This leaves the capital account and reserves. While in principle, government could seek foreign equity participation in the central bank, this seems inappropriate for a range of political reasons. But one form of foreign participation that may be feasible and more palatable would be to seek to use some portion of the aid flow to government for capitalization, not on a recurrent flow basis, but as a one-off capital transfer. A further alternative might be to capitalize the Bank by reassigning (across the consolidated balance sheet of the public sector) some portion of the official net international reserves. Though current conditions may not be immediately favourable, this re-capitalization process could be undertaken gradually through a programme of reserve accumulation somewhat in excess of the level required for standard precautionary purposes.¹²

II. INFLATION CONTROL AND THE RESERVE MONEY PROGRAMMING

The third way in which we might pose the question of whether monetary policy in Uganda has been too costly is in terms of a well-defined counterfactual. Specifically, the question is whether the instruments of monetary policy could have been deployed in a manner which would support a higher sustainable growth in real output and/or lower volatility in output and consumption without yielding on the inflation target. This is the question I address in this and the next section. In doing so, I draw heavily on analytical work by Adam *et al* (2008) in which we use a fully-specified simulation model calibrated to reflect the fundamental characteristics of an economy such as Uganda to analyse the properties of alternative monetary policy rules. . The conclusion from these sections is that there have been episodes in the recent past where policy choices probably did lead to a monetary stance that was inefficiently tight, but that changes in operating procedures in Uganda in recent years have substantially eliminated previous policy errors.

As noted, Uganda's impressive record on inflation over the last decade has been anchored by a relentless adherence to a tight reserve money programme, heavily buttressed by the cash-budget fiscal rule. In recent years, however, concerns have been raised about the continued efficacy of the reserve money programme. The first is that the programme is becoming less successful at anchoring inflation and the second is that its operation has stifled both the lending activities of the banking system and the development of effective interest rate channel of monetary policy transmission.

¹² This proposal has similarities to the recently-enacted Deposit Auction Facility of 2008 which has allowed interest earnings on foreign reserves in excess of the program target to defray the cost incurred on auctioned deposits.

The reserve money programme in Uganda nests a money-based nominal anchor for inflation within a quantity theory of money framework. The proximate anchor is the broad money supply (M), whose path the monetary authorities seek to influence through balance sheet operations aimed at controlling the path of reserve money (H).¹³ Control of the latter has typically been implemented in the context of an IMF programme where a ceiling on the overall growth in reserve money has been combined with a floor on growth of net foreign assets (NIR). Together these targets imply a ceiling on net domestic asset (NDA) growth.

The sources of instability in a reserve money programme can be highlighted through some simple manipulation of the identity underpinning the quantity theory of money which takes the form

$$(7) \quad M_t v_t = P_t y_t$$

where M denotes the broad money supply, P the price level, v the velocity of circulation, y real output, and t is a time index. From (7) we can derive the link between money growth and an inflation target that underpins the Uganda programme. To do so, we first compute the change in the natural log of (7), noting that for any variable X the change in the natural log is approximately the growth rate of X . Thus

$\Delta \ln X_t \approx (X_t - X_{t-1}) / X_{t-1} = \hat{X}_t$ denotes the growth rate in X . It follows that $\Delta \ln P_t \approx \pi_t$ is the rate of inflation. Denoting target variables by a star (*) and projections by the superscript p , we obtain a target growth rate for broad money, conditional on assumptions about the growth in real income and the velocity of circulation

$$(8) \quad \hat{M}_t^* = \pi_t^* + (\hat{y}_t^p - \hat{v}_t^p)$$

Next, denoting by m the money multiplier, we can define the *ex ante* relationship between the target growth rate of the broad money stock and reserve money (H)

$$(9) \quad \hat{M}_t^* = \hat{m}_t^p + \hat{H}_t^*$$

Combining (8) with (9) we derive an inflation-consistent reaction function for reserve money growth

$$(10) \quad \hat{H}_t^* = \pi_t^* + (\hat{y}_t^p - \hat{v}_t^p - \hat{m}_t^p)$$

Finally, from the asset-side counterpart to reserve money $H_t = Z_t + D_t$, where Z denotes net international reserves and D net domestic assets. Letting $\theta_z = Z / H$ denote the long-run share of net international reserves in reserve money, we can express the growth in

¹³ The authorities track both M2A and M3 measures of money where the latter includes onshore foreign currency deposits.

base money as $\hat{H}_t^* \approx \theta_z \hat{Z}_t + (1 - \theta_z) \hat{D}_t$ and (10) in terms of a reaction function for net domestic assets¹⁴

$$(11) \quad \hat{D}_t^* = \frac{1}{(1 - \theta_z)} \left[\pi_t^* + (\hat{y}_t^p - \hat{v}_t^p - \hat{m}_t^p) \right] - \frac{\theta_z}{(1 - \theta_z)} \hat{Z}_t^*.$$

Equation (11) therefore defines the target growth rate for net domestic assets given the inflation target, the projected growth in income, assumptions about the growth in velocity and the money multiplier, and the target growth rate in net international reserves. For any given inflation target, the permitted growth in net domestic assets (the principle component of which is domestic credit to government) increases with faster projected growth, a decline in velocity and/or the money multiplier, but decreases the higher the rate of net foreign asset accumulation.

Equations (10) and (11) thus describe the *ex ante* operation of a conventional reserve-money (or NDA) programme such as the one used in Uganda.¹⁵ Under the MTEF, government lays out annual targets for real GDP growth, inflation and its anticipated domestic deficit financing requirement. These are combined with the Bank of Uganda's estimates for the velocity of circulation and money multiplier to derive a target path for reserve money which, in turn, is integrated with the government's projections for net domestic credit and the programmed level of foreign exchange reserve accumulation to determine a target for net domestic assets (and hence the anticipated level of bond sterilization).

With some simple manipulation, they also provide a useful basis for decomposing deviations of actual inflation from the inflation target.

First, note that the quantity equation (10) holds both as a description of behaviour *ex ante* and as an accounting identity *ex post*, allowing us to write (8) and (9) as follows, where the absence of any superscripts indicates actual outcomes.

$$(8') \quad \hat{M}_t = \pi_t + (\hat{y}_t - \hat{v}_t)$$

$$(9') \quad \hat{M}_t = \hat{m}_t + \hat{H}_t$$

so that (10) becomes

$$(10') \quad \hat{H}_t = \pi_t + (\hat{y}_t - \hat{v}_t - \hat{m}_t).$$

¹⁴ The growth in net foreign assets consists of two components $\Delta Z_t = E_t \Delta z_t + \Delta E_t z_{t-1}$ where the second term represents revaluation effects. This term does not contribute to the growth in reserve money but an increase in the net worth of the central bank. The expression \hat{Z}_t in equation (11) thus excludes exchange evaluation effects.

¹⁵

By the nature of identities, the terms \hat{v}_t and \hat{m}_t are now endogenous, in other words they are the ‘solved-out’ actual values of the change in velocity and the money multiplier that satisfy the identities (8’) and (9’). Combining (10’) with (10) we derive a simple expression for the deviation of actual inflation from its target as

$$(12) \quad (\pi_t - \pi_t^*) = (\hat{H}_t - \hat{H}_t^*) - (\hat{y}_t - \hat{y}_t^p) + (\hat{v}_t - \hat{v}_t^p) + (\hat{m}_t - \hat{m}_t^p).$$

From equation (12), the over-shooting of inflation relative to target can be explained in terms of the conventional determinants, namely excess growth in base money (reflecting demand-side pressures) and/or slower than projected real output growth (reflecting supply-side pressures) as well structural determinants namely the deviations in the growth rate of velocity and the money multiplier relative to their projected values. We consider each in turn to help understand recent inflation dynamics.

Conventional factors, recent inflationary pressures and the policy response

In recent months, and in line with most economies in the region, domestic inflation has risen sharply and is now substantially above the Bank of Uganda target of 5 percent per annum. Headline inflation reached 15.6 percent per annum in August 2008 and core inflation 13.4 percent per annum. By May 2009 the corresponding rates were 12.4 percent for headline and 10.3 percent for core. Whilst some of this acceleration reflects one-off tariff adjustments, including for water, whose effect will be temporary, the month-on-month price indices suggest that inflationary pressures are more persistent. This reflects both demand side and supply-side factors. Aggregate demand pressures are partly reflected in the widening of the current account deficit, which is projected to increase from 8.6 percent of GDP in 2006/07 to 12.6 percent in 2007/08 and almost 14 percent in 2008/09.¹⁶ This increased deficit, which is the counterpart to strong growth in FDI, remittances and continued official aid flows, is also associated with substantial demand pressures in the non-tradable goods and services sectors such as in housing and construction.

In the short run, however, the strongest pressures on inflation come from the supply side, most notably from the recent rise in world prices for energy and food. Given Uganda’s geography and the state of its infrastructure, which means transport and energy account for a substantial share of total input costs, the pass-through from energy prices to core inflation is rapid and substantial. At the same time, the impact of the rise in world food and commodity prices across the region as a whole has shifted regional demand in favour of Ugandan-produced substitutes. In the medium term this is a wholly favourable development, but to the extent that there is limited capacity to increase output in the short-run, these demand effects are likely to be inflationary (even if they do have positive balance of payments effects).

¹⁶ IMF (2008b). These figures reflect the current account deficit before grants. The corresponding figures for the current account after aid show an even sharper increase, moving from 2.0 percent in 2006/07 to 8 percent in 2007/08 and 9.5 percent in 2008/09.

In general, the first-round price effects of supply-side shocks to inflation are best accommodated, which is why such prices are typically excluded from core-inflation in inflation targeting regimes. But if these shocks are persistent they will feed through into firms' cost structure and hence into price setting in the wider economy. Other things equal, this puts downward pressure on the equilibrium path for real wages and calls for some degree of tightening of the monetary stance to ensure inflation expectations remain anchored to the long run inflation target.

In assessing their response to these conventional developments, the authorities must consider two factors. The first is how tight the squeeze needs to be and the second is how rapid. How tight will depend on the authorities' view on the strength of the aggregate demand pressures and on their assessment of key supply side developments.

First, the authorities must take a view on the likely persistence of the world food and fuel price increases and hence estimate the indirect, second-round, effects of these on domestic pricing. The more temporary the shock is perceived to be, the stronger the case for accommodation (i.e. letting the price rises feed through to the domestic price-level in the short run in the expectation that beyond the initial jump in prices, the inflationary effect will be short-lived). However, given the relatively low price elasticity of demand for fuel and the limited scope for a rapid global supply response given the two decades of under-investment high energy prices are likely to be persistent. Similar arguments may be advanced for world food prices, which in turn may be exacerbated by the energy intensity of food production and the pressures coming from the demand for bio-fuels. The implication, then, is that these shocks are likely to persist. Set against this, however, is the question of how recent developments in global financial markets may affect this assessment.

Since Uganda remains a net importer of fuel (if not food) this represents a worsening of the terms of trade, *ceteris paribus*, to which the economy needs to adjust if it is to remain competitive. In the context of an inflation target, the relevant question is then whether wage bargainers would be prepared to accept a cut in real wages coming from a worsening in the terms of trade, without requiring a compensating increase in money wages. The evidence from OECD economies during the early phase of the current oil price boom suggests that the credibility of monetary regimes did ensure that the rising oil prices entailed relative price changes and a squeeze in real wages without triggering a rise in average inflation (Blanchard and Gali, 2007). This has not been the case since 2007, however, as inflation rates have sharply moved outside target ranges, albeit by substantially less than a full pass-through of the oil and food price increases would have entailed.

A similar logic applies to developments in domestic food prices, but in this case the assessment also depends on the capacity of domestic producers to respond to demand from the region. This is part of a broader assessment of the dynamics of the current investment boom and in particular the speed with which investment expenditure – which adds to demand pressures -- translates into an effective expansion in potential output.

This then is a question about the position of the long-run aggregate supply curve and the slope of the short-run curve. A pessimistic view, which sees limited increase in potential and a steep slope in the short-run, will lead the authorities to bear down aggressively on demand in the short run at the cost of undermining the efficient installation of capacity. An over-optimistic assessment, on the other hand, built on the belief that the short-run supply curve is flat and that the investment boom will stimulate a large increase in long-run potential output, will induce too loose a stance and thereby risk entrenching higher inflation expectations and lower external competitiveness.

How quickly the authorities should seek to bring inflation back towards its target is also a critical question. This is a problem for all monetary authorities, not just those operating explicit full-fledged inflation targeting regimes. It is particularly acute at present for those industrialized economies that are experiencing inflation rates far in excess of their targets but have also been hit by adverse shocks arising from the credit crunch and widespread failure of the financial sector. While the former suggests a degree of tightening, the systemic risks posed by the latter means that a further loosening of the stance is probably required. Whether this undermines the credibility of the central bank depends, it is argued, on the ability of the authorities to communicate their policy position. Attempts to bring inflation back to its target too rapidly is dangerous, especially when the economy has been hit by adverse shocks. It risks putting unnecessary real costs on the economy, undermines the central bank's credibility and might erode political confidence in the inflation targeting regime.

The problem is probably less acute in Uganda at present. There is a case for tightening in practice and in signaling clearly that some tightening is taking place and may be expected to continue. But this should not be too aggressive for at least two reasons. The first is that some of the one-off price adjustments which have boosted inflation in recent months will pass through in the coming months. The second reason reflects uncertainty around the current crisis in global financial markets.

Because Uganda, like most low-income countries in Africa, is not closely integrated into global asset markets, it is relatively sheltered from the first-round effects of the credit crisis. The impact will, however, be felt as the credit crisis feeds into the real economy and into global demand pressures. There is little doubt that the major western economies are entering a recessionary phase but the implications for countries such as Uganda will depend to a large extent on the reaction of the large fast-growing economies of China and India. It is too early to judge exactly how demand conditions will evolve over the coming months but it is likely that, they will conspire to ease supply-side inflationary pressures, although this may be offset by falling export commodity prices.

Structural factors: shifts in velocity and shifts in the money multiplier

Equation (12) also shows how a failure to hit the inflation forecast can also emanate from higher-than-anticipated growth in the velocity of circulation and from a higher-than-anticipated growth in the money multiplier. These reflect changing portfolio behaviour on the part of the private sector and the banking system respectively.

Most *ex ante* reserve money programmes assume velocity and the money multiplier are relatively stable (around a trend) and thus relatively predictable so that $(\hat{v}_t - \hat{v}_t^p) \approx 0$ and $(\hat{m}_t - \hat{m}_t^p) \approx 0$. In Uganda this was a pretty reasonable approximation during most of the post-1992 period – which gave the reserve money programme its heft – but since 2000 both ratios have become increasingly volatile and less predictable.

The velocity of circulation (which reflects the underlying structural demand for money) has become much less stable as a result of the *de facto* openness of the capital account which means that domestic and foreign asset holders are more able to rapidly adjust their asset portfolios in response to changing (expected) economic conditions, both in the domestic and regional economy.¹⁷ In recent years, positive changes in sentiment have underpinned both a surge in remittances and other private capital inflows (including ‘carry-trade’ incentives arising directly from persistent interest rate differentials) and have shifted the relative demand for financial assets, including money, in favour of Shilling-based assets. In addition, developments in the regional economy, ranging from the improved security situation in Northern Uganda and Southern Sudan to the political turmoil in Kenya in early 2008 have contributed to the emergence of the Ugandan Shilling as a regional reserve currency, thereby stimulating an autonomous shift in velocity. How persistent this regional portfolio shift proves to be is difficult to predict.

Unanticipated shifts in the money multiplier function in exactly the same way. An increase in the money multiplier increases the leverage of growth in the monetary base on broad money and hence inflation, other things equal. The multiplier will rise if the either there is a shift by the banks in favour of cash relative to deposits and/or a fall in the reserves to deposit ratio.¹⁸ In addition, shifts between domestic and foreign currency deposits will generate autonomous shifts in the money multiplier if the targeted money supply is an M2 measure as opposed to an M3 measure including foreign currency deposits (Berg and Borenstein, 2000).

The post-stabilization period in Uganda has seen the multiplier shift substantially in response to changes on both the liability and asset sides of the banking sector’s consolidated balance sheet. On the liability side, there has been a steady decline in the cash to deposit ratio, c , from around 40 percent of M3 in the early 1990s to around 30 percent today, and a corresponding but slightly larger increase in foreign currency

¹⁷ When there are limits on capital account transactions agents can only adjust their wealth portfolios slowly by increasing or decreasing the current account; with an open capital account adjustment can be virtually instantaneous.

¹⁸ Defining base money (H) and broad money (M) in terms of the liability-side of the relevant balance sheets, where C denoted cash in circulation, R reserves of the banking system, and D the deposit liabilities of the banking system then the money multiplier can be defined as $m = M / H = \frac{C + D}{C + R} = \frac{c + 1}{c + r}$ where c denotes the cash ration (C/D) and r the reserve to deposit ratio (R/D). The derivatives, $m_c < 0$ and $m_r < 0$ follow directly.

deposits which now account for approximately 30 percent of M3. In both cases the big trend changes occurred in the late 1990s (Figure 4).

Even so, the cash to deposit ratio remains volatile and, fundamentally outside the control of the authorities. For example, as low inflation becomes more entrenched and financial innovations -- such as the use of cheques, credit and debit cards and especially ATM machines and the emergence of mobile-phone-based cash transfer services -- take root, we might expect the cash ratio to decline, as it has done worldwide. But in Uganda, the cash ratio has actually risen quite steadily since around 2003, most likely reflecting the gradual formalization of previously informal economic activities, especially in the rural economy, and, as noted, the increase in the use of the Ugandan Shilling as a regional reserve currency. In both cases, the demand for money is likely to be dominated by the demand for cash rather than bank-based deposits.

Similar factors are in play on the asset side. Historically, banks in Uganda, as elsewhere in Africa, have consistently held excess reserves (Figure 5). Banks are required to hold the equivalent of 9.5 percent of their total deposit liabilities, both Shilling and foreign currency denominated, in the form of unremunerated cash balances at the Bank of Uganda.¹⁹ In practice, banks' reserves typically exceed this minimum by around 4 to 5 percent of total deposit liabilities. Over time, there has been a substantial and steady decline in banks' excess liquidity, absolutely -- from around 20 percent of deposits in the mid-1990s to below 12 percent in 2007 -- and relative to the required minimum. But the reserve ratio also remains volatile.

Whether this volatility matters for the conduct of policy depends to a large extent on whether excess liquidity is viewed as precautionary or involuntary. In the former case banks voluntarily hold reserves in excess of the statutory requirement to meet their own precautionary requirements which, for example, may reflect extreme volatility in the deposit base or unavoidably high lending risks. By contrast, 'involuntary excess liquidity' reflects a low or zero opportunity cost to reserves on the margin. In either case, the existence of large excess reserves undermines the effectiveness of reserve requirements as instruments of monetary policy, because changes in the required reserve ratio require no adjustment in the overall volume of bank loans and deposits. Rather the money multiplier adjusts endogenously.

But the reaction to an increase in bank liquidity is different. If banks maintain excess reserves on a prudential basis, then an increase in bank liquidity is likely to be allocated partly to reserves and partly to new loans. By contrast, where excess reserves reflect a very low marginal return to lending net of intermediation costs -- a situation that is more likely where legal minimum deposit rates are binding and/or banks have monopoly power in the loan market -- policy instruments that alter the monetary base may have little or no impact on lending conditions and broader monetary aggregates since the money multiplier will adjust endogenously to movements in base money. The impact on economic activity will therefore be nugatory.

¹⁹ Banks are also permitted to count 40percent of their vault cash as reserves.

Implications for the reserve money programme.

The key point, both in terms of shifts in velocity and shifts in the money multiplier is that these movements reflect behavioural shifts which are not only outside the control of the monetary authorities but are difficult to predict.

The reserve money programme as typically construed is unusually poorly structured to handle such changes, as can be seen from equation (12). Consider the case where, starting from a position where the economy is hitting its inflation target, it experiences a positive but unanticipated shift in the demand for money, leading to a fall in the velocity of circulation. How this translates into price (and exchange rate) dynamics depends on the monetary response. For convenience, assume both that there is no short-run impact on growth, so that the latter remains on target such that $(\hat{y}_t - \hat{y}_t^p) = 0$, and that the capital inflow has no impact on the growth of the money multiplier so that $(\hat{m}_t - \hat{m}_t^p) = 0$.

In the case of a pure exchange rate float, the central bank does not intervene in the foreign exchange market so that the market-clearing price of foreign exchange falls, appreciating the Shilling, thereby lowering the cost of imports and squeezing the net trade position. If the fall in velocity is not accommodated, so that $(\hat{H}_t - \hat{H}_t^*) = 0$, the increased growth in money demand is not associated by a corresponding increase in the growth of the supply of money. Money market equilibrium is thus restored by a fall in inflation and the target is under-shot.

If, on the other hand, the authorities respond to the latent pressure on the exchange rate by intervening to buy foreign exchange, this will increase net international reserves and lead to an incipient growth in reserve money. Strict adherence to the reserve money programme requires $(\hat{H}_t - \hat{H}_t^*) = 0$ so that the authorities are drawn into bond sterilization of this growth to keep reserve money on track (i.e. the increased growth in net international reserves is offset by a reduction in net domestic assets as the authorities sell debt). This entails upward pressure on interest rates, thereby contracting aggregate demand through the interest rate channel.

In both cases, the failure to accommodate the downward shift in velocity leads to monetary policy imparting an inappropriate deflationary impulse. How this is achieved and which sectors feel the brunt varies; in the former case this is achieved through an exchange rate appreciation / inflation under-shoot – hitting in the first instance the export sector -- and in the latter through higher interest rates, thereby impacting the domestic economy.

The same logic applies in reverse; unanticipated adverse velocity shocks that are not met by a tightening of reserve money will lead inflation to overshoot, other things equal.

III. EXTERNAL SHOCKS, PORTFOLIO FLOWS AND BOND STERILIZATION

In the context of a reserve money programme, the logical implication from the forgoing is that the appropriate policy response to this sort of structural shift is to allow for an offsetting accommodation, i.e. an increase in the growth of reserve money. In practice this may entail unsterilized intervention, so that reserve money growth is achieved through a rise in net international reserves. Alternatively, if the authorities remain committed to a pure float, the required increase in the supply of money may be affected by a 'reverse sterilization' under which the central bank engineers an increase in base money through the purchase (retirement) of domestic debt instruments.

Two contrasting examples.

While the simple logic is watertight, both responses are often counter-intuitive in the context of the reserve money programme, most probably because the programme tends to focus attention on the instrument (reserve money) rather than the ultimate target (inflation). The reaction to two recent episodes in Uganda illustrate contrasting reactions to velocity shocks. The first episode is the aid surge 1999 and 2003. During this period high aid inflows were accompanied by a strong private portfolio switches in favour of domestic money. Velocity fell sharply as private capital flowed into the economy. The combined effect of the surge of official and private capital was an appreciation in the equilibrium real exchange rate.

Faced with pressures to lean against the real appreciation, the Bank of Uganda was drawn into heavy foreign exchange intervention. However, the failure to recognize the shift in velocity meant that the Bank acted too aggressively to sterilize the growth in liquidity arising from the intervention in order to keep reserve money growth in line with the original target. The direct consequence was that between 1998 and 2001 domestic debt tripled in value, albeit from an extremely low level (around 1.5 percent of GDP in 1998), and by 2001/02 domestic debt service accounted for almost 5 percent of domestic tax revenues. The pressure to sell domestic debt put enormous pressure on domestic interest rates which rose from around 7.5 percent in the first quarter of 2000 to around 20 percent a year later. This episode was the origin of the current anxiety about the high cost of monetary policy in Uganda.

Attempts to target the real exchange rate (at a more depreciated rate than its equilibrium) are only possible if the authorities are prepared to let domestic interest rates exceed their equilibrium. So, even if there had been no shift in velocity, it is likely that real interest rates in Uganda would have risen at this time. However, these pressures were exacerbated by the concurrent shift in money demand so that domestic interest rates were driven even higher than they otherwise would have been.

This contrasts with the second episode which was the Bank of Uganda's response to the sharp private capital inflow in June 2007 (see IMF, 2008a). In this case, there was another well-defined portfolio shift (i.e. a sharp decline in velocity) and as before, the authorities, concerned to avoid excessive exchange rate volatility, intervened heavily to

stabilize the exchange rate (i.e. selling Shillings for dollars at the prevailing rate). But in this case, the Bank correctly recognized the nature of the portfolio shift and did not seek to sterilize the growth in reserve money arising from intervention. Thus the increased demand for money was accommodated by letting the supply of liquidity increase. Reserve money growth exceeded its programme target but given the shift in velocity this was, of itself, not inflationary. Had the authorities followed their earlier practice and attempted to stick to their reserve money target, the consequence would have been a sharp increase in domestic interest rates and either a greater deflationary shock to the economy or further private capital inflows seeking to take advantage of the interest rate differential.

The lessons learnt were important and have underpinned the decision to move away from a tight adherence to the RM programme at the end of 2007 in favour of anchoring the programme on NDA.²⁰ Recognizing these problems, from December 2007, the programme was modified so that the near-term target became the net domestic assets of the central bank (NDA) rather than RM, (which is to remain as an ‘indicative’ target) thereby allowing for greater flexibility in response to portfolio (money demand) shocks.

Inflation targets and the exchange rate: reconciling competing objectives

As we discuss in more detail in Section V, one powerful argument for adoption of a full-fledged inflation targeting is that it automatically avoids the problem of anticipating and responding to velocity shocks which in the context of reserve money programming alter the relationship between the intermediate and ultimate target of policy and can draw the authorities into policy errors of the kind just described. Under an IT regime, inflation itself provides a more direct signal of whether policy needs to be tightened or loosened.²¹

Thus a conventional presentation of the inflation-targeting literature argues for a clear and unambiguous prioritization of the inflation target with the authorities forgoing any attempt to manage the exchange rate. This argument that the authorities should not target the exchange rate does not imply that they should ignore it -- not least because the exchange rate plays a central role in forecasting inflation – but that it should be made clear that the authorities are not beholden to any specific value of the currency, thereby removing incentives for speculative attacks. Moreover, the argument goes, a non-interventionist stance creates the positive incentives for the private sector to develop the capacity to price and manage exchange rate risk.

But this argument probably does not do justice to the centrality of the exchange rate in low-income countries such as Uganda. Money and foreign exchange markets are extremely thin both relative to the size of the economy and, more importantly, relative to

²⁰ Note that with this revision, the programme in Uganda now has no formal nominal anchor. Only if the floor on NIR is binding will a ceiling on NDA allow RM to be controlled. If NIR floats off its floor, the anchor is lost. This, in some sense, is the hall mark of moves towards full-fledged IT: a formal but non-institutionalized inflation target, multiple objectives and only partial adherence to a well-defined monetary anchor.

²¹ This does not, of course, mean that the authorities should ignore velocity or multiplier shocks since they enter directly into the monetary transmission mechanism.

the size of the shocks they face. The idea that the foreign exchange market can fully absorb the kind of external volatility facing Uganda is fanciful so that some degree of intervention is almost inevitable.

This concern is magnified if the economy is also subject to portfolio shifts. The standard approach to the choice of exchange rate regime finds fixed exchange rates to be preferable (for stabilizing output) when portfolio shocks are dominant, because these shocks require portfolio reallocation but not real exchange rate adjustment; floating rates, in contrast, are preferable when real shocks, which require real exchange rate adjustment, are dominant. Exposure to portfolio shifts, which arise as an inevitable counterpart to open capital accounts and thin domestic asset markets, may therefore create substantial tensions between *de jure* commitments to flexible exchange rates in support of an inflation or money anchor and the *de facto* conduct of monetary policy which may involve substantial intervention.

This tension is highlighted in the management of aid inflows which present the fiscal and monetary authorities with the dual problem of managing the real absorption of the resource transfer and, in addition, managing the foreign exchange inflows and liquidity generation associated with the resource transfer. Many of these problems are discussed in the context of Uganda by Brownbridge and Tumusiime-Mutebile (2007) who note that, amongst other things, the shift in favour of budget support mechanisms reinforces the link between aid flows and domestic credit creation and hence draws the central bank directly into concerns about exchange rate volatility and liquidity management.

Recent work by Adam *et al* (2008) uses simulation methods to examine how different monetary rules handle volatile aid inflows in circumstances where portfolio shifts are important. This work shows that policy rules that involve a degree of unsterilized exchange rate intervention tend to deliver lower volatility in inflation, interest rates, exchange rates and output than either of the strategies implied under a conventional reserve money programme, namely a pure float or one of exchange rate intervention supported by bond sterilization. This contrast is particularly stark if fiscal spending matches aid inflows by less than dollar-for-dollar, possibly because of concerns about short-to medium run absorptive capacity or because the fiscal authorities are keen to use aid to reduce domestic deficit financing (both motivations being present in Uganda in the last decade).

To understand why this is so it is important to consider what is happening to velocity and, hence, why a pure exchange rate float may lead to excess volatility. The essential step is that aid inflow (or other autonomous capital inflows) will tend to lead to a positive shift in the demand for money, more so if part of the aid is saved.²² This shift reflects, in part, an income effect, but also the reduction in expected inflation contingent on the fall in domestic budget deficit, since the unspent component of the aid substitutes for domestic seigniorage financing of the deficit. In these circumstances, a pure float (which we also can think of as full and instantaneous foreign exchange sterilization) which entails no

²² Over the 1990s, the average propensity to save out of aid inflows in post-stabilization African economies was approximately 0.25 (Adam *et al* 2008).

increase in reserve money, triggers exactly the outcome noted above; namely an undershoot of inflation and/or an excess appreciation in the nominal exchange rate.²³ Over time, this pattern of response to aid flows will generate higher volatility in the nominal exchange rate and inflation. Sterilized intervention has the same deflationary effects although in this case the squeeze on reserve money growth is reflected in high and volatile domestic interest rates.

By contrast, rules that seek to match the evolution in the demand for money by injecting corresponding liquidity will perform better. In the context of a long-run commitment to a flexible exchange rate, one such rule is the *reserve buffer plus float*, under which foreign exchange sales are tied directly to the growth in liquidity generated by domestic spending out of aid, where the latter is governed by the absorptive capacity of government. This entails initially accumulating aid inflows as official foreign exchange reserves (i.e. initially stabilizing the nominal exchange rate) and then sterilizing the full domestic currency counterpart of aid-financed non-import spending through foreign exchange sales as it occurs (i.e. letting the exchange rate float).²⁴ The key point here is that the initial (unsterilized) intervention *increases* the supply of reserve money but does so exactly in line with the increase in money demand, thereby stabilizing inflation.

It is important to stress three critical features of this rule. The first is that by accommodating the demand for money / portfolio shift this rule stabilizes the path for the nominal exchange rate (relative to the pure float). The second is that the intervention injects liquidity *at exactly the time that there is an increased demand for liquidity* so that no further bond sterilization is required.

The third key point is that while allowing for exchange rate intervention to forestall otherwise damaging exchange rate volatility this rule remains consistent with an inflation target and a fundamental commitment to a floating exchange rate.

Whereas under a conventional exchange rate crawl the central bank targets the nominal exchange rate, without reference to the pattern liquidity creation, under the *buffer plus float*, the central bank does not pay direct attention to the nominal exchange rate. Instead it sets a time-varying reserve target that corresponds to aid financing that has not yet been spent, and allows the exchange rate to float freely once this reserve target is satisfied.

²³ Notice what is going on here. The pure float leaves the money supply unchanged while demand for money increases. Domestic money is now relatively scarce so that its equilibrium price increases (the exchange rate appreciates)

²⁴ The implicit assumption here is that budgetary aid accrues in the form of dollar deposits at the central bank. Until aid dollars are sold by the central bank, an aid surge has no impact on reserve money because net international reserves and net domestic credit to government change in equal and opposite directions. As aid is spent (increasing the fiscal deficit), the import component of spending continues to leave domestic liquidity unchanged because net international reserves fall by the import component of the rise in the fiscal deficit (while in the background, net domestic credit rises by the same amount). The liquidity injection associated with aid corresponds to the non-import component of aid-financed spending. A *buffer plus float* policy uses foreign exchange sales to sterilize this in full, leaving seigniorage unchanged.

The original work by Adam *et al* (2008) focuses principally on aid flows and the associated shifts in the demand for money that may accompany them. But the key insight applies to all circumstances where external shocks are expected to be associated with portfolio shifts. The most obvious parallel arises in the context of commodity price volatility especially in natural-resource economies where fiscal linkages via the budget mean the transmission channels from external price volatility to the domestic economy closely resemble those operating in the presence of aid volatility (see Adam and Goderis, 2008).

To summarize, the *buffer plus float* class of policy rule retains the anchor of an explicit inflation target but offers a clear articulation of how the authorities should act in the face of a particular set of events, specifically those which may be expected to lead to a shift in the demand for money. In this sense, the rule is an (analytical) formalization of the NDA anchor currently being employed by the Bank of Uganda.

Embedding this kind of flexibility within a coherent monetary framework requires coherence both at the level of policy coordination and in terms of communication. We return to this issue in Section V.

Bond sterilization and financial sector development

One of the implications of this analysis is that faced with favourable asset portfolio shifts induced by aid and private capital inflows, there is a risk of 'excess' bond sterilization. The previous section has stressed the impact of this strategy on the exchange rate and domestic interest rates and the consequent deflationary risks this imposes on the economy. But there may be other structural concerns in play. In particular, the Bank should probably be concerned about the potential effects substantial bond-sterilization may have for the nascent development of local capital markets. Heavy bond sterilization risks distorting domestic asset markets in favour of short-dated public debt. Through the early years of the century Treasury bills rapidly grew to dominate banks' assets. By 2002 claims against central government exceeded claims on the private sector (see Figure 6). As noted above, this dominance of the banks' asset book has declined quite sharply in recent years as lending to the private sector has picked up but public debt still features very strongly to the potential detriment of further development of domestic capital markets and it remains the case that with banks' and other market players' attention focused on the trading of gilt-edged government debt instruments, incentives to develop private debt markets -- including the interbank market -- are blunted. The more the authorities can ease back from bond sterilization -- in a manner that does not jeopardize macroeconomic stability -- the more banks will need to actively compete for the smaller stock public debt and the greater the incentives for them to further extend lending to the private sector. By the same token, the less dominant is the short-run treasury bill market, the stronger the incentives for broader capital market innovation and development to emerge.

It is important to stress that these considerations operate at the margin and emerge from a particular set of circumstances that result in positive, anticipated, shifts in money

demand: they do not imply that there is no role for bond sterilization in monetary policy in Uganda in general. Tradable public debt instruments, whether government debt or central bank paper, are essential policy instruments for managing the path of liquidity. Given the multiple short-run objectives of the Bank (which include minimizing short-run exchange rate and interest rate volatility), multiple market-based instruments are invaluable, particularly if the focus is on short-run liquidity management.

Fiscal deficits and domestic debt

This still leaves the question of whether the overall fiscal stance in Uganda means that a continued net issuance of domestic debt is 'almost unavoidable', as implied in the MFPEP 'Debt Strategy' (2007) states? To address this question we must be clear about the context. Two polar cases highlight the issues at stake.

The first case, which has not been the prevailing circumstance in Uganda over recent years, but as the global recession bites may well become so in the short- to medium-term, is the textbook one of the relationship between the fiscal stance and macroeconomic stability. The relevant decisions here for the monetary authorities are first, whether the overall deficit *after aid and other foreign financing* is compatible with macroeconomic stability and second, how domestic financing should be balanced between conventional domestic borrowing and seigniorage (i.e. the growth in reserve money). The latter will be determined by the indicative inflation target, the demand for reserve money and the expected growth in the real economy (see notes to Table 1).

The issues in this case are well-known and do not need to be reviewed in detail here. The simple conditions for debt dynamics highlight the key elements. Taking the medium-term real interest rate and growth rate as given and, for simplicity, assuming that external financing of government is all in the form of grants and is exogenous, the inter-temporal budget constraint of government allows us to define the debt-solvency/sustainability condition as

$$(13) \quad d_0 \leq \sum_{t=0}^{\infty} \left(\frac{1}{1+r-g} \right)^t [ps_t + (\pi_t + g_t)m_t]$$

where d denotes the debt stock, m the stock of reserve money, and ps the primary surplus (after aid), all expressed as a percentage of GDP. The real interest rate on debt is denoted as, r while g denotes the growth rate of GDP and π the rate of inflation.

Equation (13) simply states that sustainability requires that the current stock of debt must be less than or equal to the present discounted value of the stream of future primary surpluses plus seigniorage revenue.²⁵

²⁵ The primary surplus in this instance is total revenue including grants less total government non-interest expenditure. Seigniorage consists of two elements, an 'inflation tax' term (the first term in the bracket) and a 'real balances' term.

Imposing the equality on (13) we get the condition for the stabilization of the public debt (as a percentage of GDP)

$$(14) \quad (ps_t + (\pi_t + g)m_t) = (r - g)d_t$$

Notice that the adjusted primary surplus plus real seigniorage can be less than the real interest on the debt stock rd_t when the economy is growing and *vice versa*: the higher is growth the lower the required primary surplus (plus seigniorage). It also follows, of course, that if $g > r$, or if seigniorage is high the stabilizing fiscal stance may be consistent with an adjusted primary deficit. If the left side of (14) exceeds the right hand side the debt stock declines (as a share of GDP) and *vice versa*. Hence we can describe the dynamics of debt as:²⁶

$$(15) \quad \Delta d_t = (r - g)d_t - (ps_t + (\pi_t + g)m_t)$$

Two issues are relevant here. The first is a rising debt ratio does not mean government is insolvent. Since the solvency condition (13) is defined in terms of the future stream of adjusted public surpluses plus seigniorage, public debt can rise without threatening solvency *as long as creditors expect the government to make the necessary fiscal adjustment at some point in the future to stabilize the debt-to-GDP ratio*.

The second is the relationship between monetary and debt policy and concerns the so-called 'unpleasant monetarist arithmetic'. Attempts to reduce inflation by reducing the growth of the money supply require a corresponding fiscal adjustment to ensure the debt stock is stabilized. Thus from equation (15), a reduction in π , other things equal will entail $\Delta d_t > 0$, unless there is an equivalent increase in ps .

To summarize, in the case of the conventional deficit financing problem, the inter-temporal budget constraint dictates the feasible trade-offs between debt, the primary fiscal stance (net of aid flows) and the inflation target. Thus, for given fundamentals (i.e. the growth rate, the real interest rate and the demand for reserve money) and a given inflation target, rising domestic debt is inevitable unless and until an appropriate level of the fiscal surplus net of aid is established. Stabilizing debt without a fiscal adjustment can only be achieved if the authorities are willing to tolerate a looser monetary stance and higher inflation.²⁷

²⁶ Letting d^* be the value of debt consistent with $\Delta d_t = 0$ given the fiscal stance, we have three simple cases: (i) $d_t = d^* \Rightarrow \Delta d_t = 0$. Here the sum of the adjusted primary surplus and seigniorage is just sufficient to stabilize the debt stock; (ii) $d_t < d^* \Rightarrow \Delta d_t < 0$. The fiscal stance is sufficiently tight that the debt stock is falling (as a share of GDP); (iii) $d_t > d^* \Rightarrow \Delta d_t > 0$. The fiscal stance is too loose to stop public debt from rising.

²⁷ This assumes that the economy remains on the 'good side' of the inflation laffer curve so that rising inflation (i.e. a higher growth in the money supply) generates more seigniorage revenue. Clearly, as is well known from the history of inflation in Uganda, there comes a point where higher inflation *reduces* seigniorage revenue. In practice, however, this rate is far in excess of any plausible or tolerable inflation target.

The second case -- where aid flows more than cover the domestic deficit, as has been the case in Uganda since the early 2000s -- is much less an issue about government funding and more about spending and absorption and reflects a deeper tension in the making of macroeconomic policy in a high-aid environment.²⁸

At the risk of over-simplifying the issues, we start with the observation that if indeed aid flows fully fund the budget, then there should be no need for domestic debt financing. If so, why is domestic debt rising and why is it such a policy concern? One answer is that, in fact, aid is not funding the deficit because the aid inflow is not being absorbed through the current account! Rather, because of concerns about exchange rate appreciation, the aid inflow is being saved (in the form of higher reserves). The result is that the supposedly 'aid funded' increase in spending is, in fact, a domestic spending increase. And since the aid is not being absorbed, this spending is, by default, being financed by domestic resources, either debt or inflation: in other words the relevant lens through this case is the conventional deficit financing problem discussed in the first case with the one difference that official reserves are simultaneously being accumulated (see IMF (2007)).

Seen in this light, the question about the 'unavoidable' growth in debt emerges directly from an unresolved tension about the scale of fiscal operations in the current environment. Put starkly, there is a tension between, on the one hand, the central bank that sees enhanced public spending as having limited supply-side effects so that the demand-side spending effects dominate and inevitably lead to upward pressure on the real exchange rate to the detriment of the tradable export sector and, on the other, the government that either believes the supply-side effects of the aid flow will be sufficiently strong to ensure that the real exchange rate appreciation will be short-lived or otherwise warranted by productivity gains, or that the loss of competitiveness is a 'price worth paying' for the broader social and political benefits deriving from the aid inflow. Since these two views are not fully reconciled, we observe the problem of an economy with an apparently strong fiscal position but with high and rising debt.

Coherence in the conduct of monetary policy, and hence the role of domestic debt, lies in the resolution of the underlying tension. Either government has to scale back aid financed expenditure or the central bank must permit higher absorption by letting the real exchange rate adjust fully. Failure to do so raises the risk that the government's pressure to spend out of aid and the central banks reluctance to absorb the aid through a widening of the current account / appreciation of the real exchange rate, can only be resolved by higher growth in domestic debt or a relaxation of the inflation target.²⁹

²⁸ By 'spending' we mean the increase in the fiscal deficit before aid -- aid that is fully spent entails the fiscal deficit before aid increases by the full amount of the aid inflow -- and by 'absorption' we mean the increase in the current account deficit before aid. From the perspective of the resource transfer perspective on aid, full absorption is required to fully transfer the aid to the recipient economy.

²⁹ This is an intentionally stylized representation of the problem. The point is, however, to clarify the essential logic of the two cases and to illustrate the circumstances in which domestic debt accumulation is or is not 'unavoidable'. More detailed discussion of these cases, including a more subtle treatment of the problem when government face credibility problems, can be found in IMF(2007), Adam et al (2008) and Buffie et al (2009).

This adjustment probably cannot happen instantly, nor, as the discussion of the reserve buffer indicated, does the logic imply a slavish adherence to the extreme case of 'full and continuous spending and full and continuous absorption (i.e. a pure float)'. The point is to lay bear the logic: the problems in monetary policy in Uganda are as much to do with the coordination of fiscal and monetary policy and expectations as they are with the mechanics of monetary policy alone.

IV. IS THERE A CASE FOR CAPITAL CONTROLS?

The dominant theme of this paper has been the challenge that official and private capital flows present to the conduct of monetary policy. The surge in private capital flows in mid-2007 is only the most dramatic episode of private capital inflows. In that instance the Bank of Uganda's response was timely and adroit. Nonetheless such flows represent a potential source of instability in the nominal exchange rate and/or monetary policy by generating potentially large changes in liquidity conditions, in both directions. A natural question is then whether there is a case for imposing controls, specifically on short-run speculative flows.

Conventional wisdom in the academic literature, including from the IMF, cautions rapid capital account liberalization (see for example, Prasad and Rajan, 2008). This caution reflects a concern about the capacity of countries with relatively underdeveloped financial sectors to successfully manage the volatility associated with foreign capital inflows. Nominal and real exchange rate volatility becomes a serious challenge while recent empirical evidence offers a more skeptical assessment of the empirical links between capital flows and growth. While capital flows clearly can support higher investment and growth, these effects are probably weaker and less direct than previously thought, particularly when financial sectors are small or under-developed. Weaker in the sense that under-developed financial systems are more likely to channel foreign capital to easily collateralized non-tradeable investments like real estate, thereby contributing to asset price booms than into investments underpinning long-run growth. Less direct in the sense that many of the benefits operate through the effect of capital flows on the development of the financial sector itself.

While this evidence supports the case for moving cautiously on capital account liberalization it says little about what to do if the capital account has already been opened, at least *de jure*. Many have made the point that in these circumstances, it may be extremely difficult, or at least very costly, to 'put the genie back in the bottle'. It is clearly not impossible, but the challenge facing any regime considering some form of tax or other 'friction' on short-run capital flows is to ensure that such a move does not undermine the authorities' credibility in general or otherwise adversely affect the flow of medium and long-term capital to the economy. The experience of other countries attempting to limit short-run flows is mixed.

The best known case is Chile which imposed taxes in the form of 'un-remunerated' reserve requirements, on short-term debt inflows in 1991. Over time, the authorities established 'minimum stay' requirements on capital flows so that the withholding tax is

waived if capital inflows endure for more than one year. Chilean authors argue that measures did not influence the volume of capital flows but tilted their maturity structure in favour of longer-dated capital flows. The experience of other countries, many of which sought to tax outflows rather than inflows is less positive. Malaysia's attempts to tax outflows in the wake of the East Asian crisis were deemed unsuccessful while those imposed more recently by India and Thailand were quickly circumvented, suggesting that attempts to re-instate controls, beyond those whose ambitions are modest, may be very difficult.³⁰

Prasad and Rajan (2008) draw a number of lessons which are relevant for Uganda. The first is that it may be easier to tax inflows (at a very modest rate) than outflows. Second, taxes may serve to best to tilt the maturity of capital flows rather than alter the volume. But finally, taxation of capital flows requires the capacity of the authorities to accurately identify and track flows through the financial system. Perceptions that capital taxation is capricious or that tax instruments will be applied in a manner that lacks transparency or systematically discriminate in favour of certain investors or investments can only serve to undermine the credibility of the authorities and thus raise the risk that policy in this area may be powerfully counterproductive.

Implementation issues

Three key issues should be addressed by the authorities as they consider whether to introduce some form of taxation on short-run capital flows. The first requirement is, clearly, a credible and robust tracking and monitoring system for capital account transactions. This is a major undertaking, particularly if the objective is to target some capital account flows and not others. Some capital flows, such as official aid flows and transactions through the formal banking system can be monitored relatively easily. The problem for countries such as Uganda is that the informal capital account is large. In the past this reflected, amongst other things, the effect of a dual exchange rate system which imposed a punitive 'tax' on capital inflows coming through official channels. But the bigger problem is that even in the absence of exchange rate distortions, a large proportion of capital flows are informal household-to-household remittances or represent the counterparty capital account transactions associated with illegal cross-border trade.

A large portion of these capital flows are intermediated through the 'formal' economy through changes in the stock of on-shore foreign currency deposits held with the banking system. But movements in foreign currency accounts will also reflect changes arising from capital account flows that one may wish to exempt from taxation (e.g. long-term flows or those associated with FDI) and current account transactions (changes in working capital balances, for example). Any monitoring system put in place must have sufficient discriminatory power to ensure that the proposed capital taxation process is appropriately targeted. This means avoiding the extremes of tax system ending up taxing all foreign

³⁰ Both Thailand (Dec 2006) and India (May – August 2007) attempted to impose controls. In Thailand, the government announced a 15 percent withholding tax on short-run inflows, prompting a massive sell-off in the equity market and withdrawal of the tax. In India, the authorities sought to limit external commercial borrowing but firms simply disguised their borrowing (Prasad and Rajan, 2008).

currency transactions or taxing only a narrow class of transactions on account of their 'visibility' rather than because they are the transactions that the authorities actively seek to discourage. Having raised these concerns, it is worth underlying that investing resources to improve the monitoring of capital account transactions is desirable regardless of whether the authorities seek to tax capital account transactions.

The second consideration is more conceptual and concerns the anticipated elasticity of portfolio flows with respect to the rate of capital taxation. Given the structure of the Ugandan economy and, in particular, the thinness of domestic asset market, it is possible that this elasticity is very low. Evidence from a range of small low-income economies in recent years suggest that potentially de-stabilizing capital inflows are relatively rare events and tend to reflect emerging (or anticipated) large interest rate misalignments between Ugandan and international capital market conditions. Relying on tax instruments to close off these channels raises the risk that the *ex ante* rate of taxation might need to be set at a high level to discourage those capital flows that the authorities most fear.

This reflects the third consideration, namely the extent to which capital controls or capital taxation represent a response to the symptom rather than the cause. Given the structure of the Ugandan economy and, possibly, the conduct of macroeconomic policy, interest rate volatility -- and induced speculative capital inflows -- will remain a persistent feature of the economy. This may suggest that the first-best response to the problem of speculative flows lies in the broader conduct of fiscal and monetary policy rather than with capital taxation.

Having said this, and recognizing the tracking and monitoring problems discussed earlier, there may still be a case for further examining options for taxing short-run capital flow, but as one component of a policy package aimed at developing and deepening the financial sector as a whole rather than as a reaction to a specific macroeconomic problem.

V. TRANSITION TO INFLATION TARGETING

In the background of all contemporary discussions on monetary policy in Uganda at present is the question of whether the authorities should adopt a formal inflation targeting (IT) framework and if so how quickly should it aim to do so. A related question is whether the process of establishing a new monetary anchor puts the current operating regime at risk. If it does, the question of timing becomes contingent: presumably any such transition should take advantage of favourable macroeconomic conditions. What might these be? In this section I briefly outline the basic tenets of an IT framework and quickly summarize some of the evidence adduced in support of this approach. I then turn to some major challenges that adoption of a full-fledged IT regime entails.

The starting point for this discussion is the challenge facing all monetary regimes, namely how to reconcile the essential tension between rules and discretion at the heart of monetary policy. The prevailing intellectual consensus stresses the benefits of maintaining a rule-based approach to hitting a target for inflation on the grounds that rules are best placed to minimize or eliminate the incentives of the monetary authorities

to operate in a time-inconsistent manner.³¹ A reserve money programme is one such rule-based approach. But inflexible adherence to rules can be costly in terms of meeting the second objective of monetary policy namely the discretionary employment of the instruments of monetary policy in judicious manner to tighten or loosen credit conditions so as to smooth excess movements in relative prices and thus moderate fluctuations in the path of domestic output relative to its trend rate of growth. Even when functioning well, reserve money targeting fulfils this second objective rather poorly.³² Inflation targeting represents a response to this challenge.

Inflation targeting

Virtually all contemporary monetary regimes, including Uganda's current reserve money programme, can be thought of as 'inflation targeting' regimes in the strict sense that a central objective -- if not the dominant objective -- of monetary policy is to establish a credible anchor for domestic prices. The choice of anchor is not an un-constrained one, however; rather it has implications for how the authorities address the other concerns competing for their attention. The fundamental nature of the constraint is encapsulated by the notion of the 'impossible trinity' or the 'trilemma' which states that beyond the short-run no country can simultaneously maintain an open capital account, target the exchange rate and pursue an independent monetary policy.³³ One of the three must be abandoned even though each of these objectives are desirable in their own right: open capital accounts to the extent they support the efficient global allocation of capital to high-return investment opportunities; exchange rate targeting to support trade and sustain a stable external value of the currency; and domestic monetary policy to pursue domestic output stabilization objectives.

For much of post-independence era, Uganda reconciled the trilemma through controls on capital flows (and, for some periods, on current account flows as well). Moreover,

³¹ The notion of time-inconsistency of monetary policy dates back to the Nobel-prize winning work of Kydland and Prescott (1977) and was developed in the context on monetary policy by Barro and Gordon (1983). The essential idea is that when the authorities set their policy instrument once the private sector has formed its expectations about inflation (possibly based on some prior announcement about the stance of policy) the authorities will have an incentive to renege on their announcement. Specifically, a monetary authority concerned about output as well as inflation will have an incentive to announce a commitment to low inflation and then renege on this commitment to exploit the short-run Phillips curve so as to boost aggregate demand. Anticipating this incentive, however, the initial policy announcement will not be credible and private sector expectations will adjust accordingly. In this situation, to make their announcements credible, the monetary authorities may want to make a commitment to a fixed policy rule.

³² In reality, reserve money programmes have tended to be employed in circumstances where initially the weight placed on inflation control was so large that relatively poor performance in terms of output or consumption smoothing was tolerated. This was certainly the case in Uganda in the early 1990s.

³³ To illustrate, consider the case of a positive external shock which raises the *ex ante* return to domestic bonds. With an open capital account private capital will flow in to eliminate the cross-border return differential, thereby generating an incipient appreciation of the currency. Attempts to stabilize the exchange rate will draw the central bank into foreign exchange intervention, thereby undermining the autonomy of domestic monetary policy through the effect of intervention on the domestic money stock. Restoring monetary autonomy through bond sterilization may work but only by driving up domestic interest rates relative to world rates, thereby exacerbating the original pressure on the exchange rate. Eventually one of the objectives must be abandoned.

despite the liberalization of capital account transactions from the mid-1990s onwards, the economy appears to have continued to successfully dodge the bullet of the trilemma, intervening aggressively in foreign exchange markets from time to time while at the same time using domestic monetary policy (by manipulating interest rates or the money supply) to attempt to influence the path of reserve money and aggregate demand. This appears to have been possible because while capital account restrictions have been lifted *de jure*, the response of private capital has been slow, whether for reasons of risk and uncertainty or ignorance. Since the early 2000s, however, as returns have fallen, risk premia become compressed and private capital has sought out ever more exotic markets, the volume of private return-sensitive portfolio capital flows has grown dramatically and the authorities have been confronted for the first time by the full force of the trilemma.

Although debate continues on the case for policy measures to limit short-run cross-border capital flows either through tax or other restrictions (see above) it is reasonable to expect that capital flows have become permanently more responsive to cross-border return differentials, even in the presence of tax distortions. Hence for Uganda, the resolution of the trilemma has become a simple choice over the nominal anchor for inflation.

Inflation Targeting regimes seek to anchor inflation by controlling expected inflation. Thus the instruments at the disposal of the central bank, be they price or quantity instruments, are set so as to influence the private sector's expected or forecast rate of inflation at some horizon. This future expected inflation rate will, according to the argument, feed into current price and wage setting behaviour, thereby validating the forecast and placing the economy on an expectations-consistent path. The essential feature of the regime is a framework within which the authorities' policy actions and announcements credibly influence the evolution of the private sector's inflation expectations. Two elements are critical.

The first is a public commitment to an explicit target for the inflation rate, defined either as a point or interval target. This commitment may also include a horizon over which the target should be hit, thereby determining how quickly deviations from target should be corrected. The target, typically set by government, may be defined either in terms of overall, 'headline', inflation or 'core' inflation, where the latter excludes specific items such as food and fuel whose prices are determined principally by supply-side effects or world market conditions and to which it will generally be more appropriate to accommodate rather than attempt to offset.³⁴

The second element is a structured approach to deliberation and communication on the part of the central bank. The objective is to resolve the problems of asymmetric information which can create incentives for time-inconsistent behaviour on the part of the

³⁴ The role of monetary policy is to use policy instruments so as to place 'sticky' prices as close to their notional 'flex-price' equilibrium values as possible. By this argument, prices that are in fact fully flexible, such as imports where variations in world prices are allowed to pass through instantly to domestic prices, should be excluded from the target. Failure to exclude them would lead to placing excess weight on the policy levers. For example, seeking to lean against a positive oil price shock – which would be the case if policy was geared to targeting headline inflation – would lead to an inefficiently tight squeeze on the non-oil price component of the headline index.

monetary authorities. Making public, in a timely fashion, the central bank's information and its analysis thereof ensures its actions are verifiable and sufficiently informative to reveal its own expectations of future developments and the relative weight it places on other objectives such as output gap or, more likely, the exchange rate. The objective is to demonstrate credibly that the authorities do not have private information about economic conditions that they can exploit in a time-inconsistent manner.

In practice this means that IT central banks publish voting records of the members of interest-rate setting committees; they publish in some form the evidence and economic analysis that informs these rate-setting decisions; and they devote substantial resources to public information and direct engagement with key stakeholders. It also usually means bringing independent external members into key decision-making bodies.³⁵

This comprehensive communication strategy applies both when inflation is on target and, *a fortiori*, when it is off-target, in which case additional disclosure requirements may be placed on the central bank to explain deviations and specify remedial action to return inflation to target. The Bank of England's 'Open Letter to the Chancellor' (Minister for Finance) is perhaps the best-known example of this approach. Important elements in establishing the credibility of this structure are the reliance on independent external membership of key decision-making bodies -- the Bank of England's Monetary Policy Committee being a good example -- and the pressures these bodies exert on the national statistics offices to produce timely and accurate data.

These two features, referred to as 'constrained discretion', describe how IT regimes resolve the rules versus discretion tension. The explicit inflation target, along with the associated components of public disclosure and explanation of policy decisions and outcomes, provides the credible constraint, the belief in the private sector's mind that the central bank will (eventually) bring inflation back on track and will do so in a transparent manner. To the extent that these structures defuse the time-inconsistency problem inherent in monetary policy, they serve to reduce the correlation between expected future inflation, upon which current wage- and price-setting is based, and current prices tends towards. In other words, the private sector is able to 'see through' temporary inflation deviations in their wage and price setting decisions.

Evidence

The recent literature on inflation targeting paints a powerful empirical case for the success of IT regimes -- at least for the period up to 2007. Countries adopting IT have generally posted significant gains in terms of credibility and, as a result, in meeting the two principal objectives of low and stable inflation and better output stabilization. Mishkin and Schmidt-Hebbel (2007) summarize the results for IT regimes as follows.

³⁵ Members of the Bank of England MPC have also stressed the importance of developing, and developing early, a 'culture of intellectual dissent' in which the central bank governor and his or her executive can find themselves in a minority on interest rate decisions, especially when such voting records are made public.

- First, countries with IT regimes tend to be associated with lower inflation and lower inflation volatility, both with respect to their own history and with respect to most non-IT countries. The exceptions are the mature ‘eclectic’ non-IT regimes such as the European Central Bank and the US Federal Reserve Board, where significant differences in relative performance are difficult to discern.
- Second, IT regimes are associated with lower output volatility, again relative to their own history and to non IT countries. Critically, this reduction in output volatility is observed to occur simultaneously with the reduction in inflation volatility. In other words, the evidence suggests that IT regimes are not simply reflecting a preference for lower inflation (and inflation volatility) over output volatility but rather these regimes have been able to gain on both fronts, unambiguously increasing welfare.
- Third, evidence from surveys of inflation expectations amongst decision makers, from bond market data and from elsewhere suggests that in IT regimes inflation expectations have fallen, often quite rapidly, within target zones upon adoption of explicit inflation targets and that deviations of actual inflation from target are quite quickly corrected (Mishkin and Schmidt-Hebbel, 2007 and Aron and Muellbauer, 2007). Moreover, the correlation between expected future inflation, upon which current wage- and price-setting is based, and current prices has fallen in IT countries (Woodford, 2007). In other words, inflation expectations are becoming more securely anchored on their target values and hence less sensitive to current inflationary developments; the private sector appears to be better able to ‘see through’ temporary inflation deviations in their wage and price setting decisions.

This is compelling evidence, all the more so because much of the research on which it is based exploits best-practice econometric methods and, by drawing on the burgeoning literature on programme evaluation, attempts to address the fundamental endogeneity associated with the choice of monetary regime. Nonetheless it must be qualified.

First, the sample of IT-adopting countries remains small with little more than 20 countries worldwide pursuing full-fledged IT regimes. Working with such a small sample means researchers cannot completely control for problems of sample selection and aggregation. Countries that have adopted IT regimes tend to fall into two groups. The first are those with robust institutional frameworks for whom the move toward IT was, at least in retrospect, a natural technical innovation in response to changing structural features in the domestic economy. Into this category might fall countries such as the UK, New Zealand and Canada: this group may be usefully identified by the oft-repeated claim of a former Bank of Canada governor that “we did not abandon monetary targets, they abandoned us!” These are countries where the much-vaunted feature of the regime, namely ‘credibility’ was, at least to a substantial degree, in place. The second group are those countries such as Israel, which adopted IT out of desperation as part of a price stabilization challenge, often after all other options had failed but also when the political commitment to adhere to the discipline of *any* regime had finally been wrought. Aggregating these two groups of countries, and their very different outcomes, generates an ‘average treatment effect’ that is remarkably hard to interpret.

A second important consideration is the global background to the IT experiment. The introduction of IT regimes coincided with the ‘great moderation’ in inflation where, broadly speaking, China and the other large emerging economies were net contributors to global aggregate supply. Since late 2006 global economic conditions have changed; inflation has risen sharply across the world as these same emerging markets have sharply added to global aggregate demand. It is too early to tell whether the IT regimes will continue to out-perform the control group in this changed global environment, or indeed how well IT regimes perform in bringing inflation expectations back to target.

The predictable if rather negative conclusion emerging from this brief review of the evidence is that it is enormously difficult to draw definitive lessons from the evidence. Superficially the evidence on inflation targeting is persuasive and it is notable that no country IT has either stepped back from the regime. Nonetheless, as I have noted, the evidence needs to be interpreted with caution and from a position which pays due attention of country-specific characteristics. It is to these issues I now turn.

Key Transitional Issues

This text-book description of the full-fledged IT regime sets the bar high and in practice only a few countries demonstrate all these characteristics. Many countries, including Uganda, may be classified as pursuing ‘Inflation Targeting lite’ regimes (Stone, 2003) which describes countries whose monetary frameworks are gravitating towards an IT configuration but where operationally the conduct of monetary policy lacks some clarity of objectives and transparency of communication. Thus while most ITL regimes tend to announce a target for inflation and, simultaneously, commit to a flexible exchange rate, the clear and verifiable prioritization of objectives may still be lacking. In many cases this lack of clarity is located in the trilemma; many ITL regimes are characterized by a strong tendency for exchange rate management so that the prioritization of the competing constraints of independent monetary policy and the desire to influence the path of the exchange rate is obscure. Moreover, structures for communication and verification are only beginning to be established; central bank balance sheets are often still too weak to allow effective deployment of policy instruments and, in some cases, core analytical capacity – in inflation forecasting and developing robust models of the transmission mechanism, for example – are only just being built.

Successful transition towards a full-fledged inflation targeting regime that is relevant to Uganda requires progress across three major fronts. In the remainder of this section I briefly introduce these. As mentioned above, these concerns are not exclusive to developing an inflation targeting regime; they are equally valuable in the conduct of monetary policy under the current reserve money programme.

Managing Fiscal Dominance

Fiscal dominance is the single greatest threat to the smooth functioning of *any* monetary framework, including an IT regime. Fiscal dominance may be defined as a situation in

which the government adopts a fiscal stance that is incompatible with sustaining low inflation without recourse to distortionary measures such as heavy taxation of financial intermediation through reserve requirements or more draconian restrictions such as those underpinning the multiple exchange rate regimes prevalent throughout the 1980s. In circumstance of extreme fiscal dominance, the actions of the central banks become fully subsumed to the over-riding requirement of funding fiscal deficits, so that the central bank loses control over the size and composition of its balance sheet. Its capacity to separate liquidity management objectives from its government funding obligations eliminates its capacity to conduct monetary policy beyond the very short run.

As noted in the introduction, Uganda's recent macroeconomic success owes much to the tight fiscal control exerted by the Ministry of Finance and Economic Development through the institution of the cash budget. The contribution of fiscal control to past successes cannot be understated, but what matters from a monetary policy perspective is not just the *ex post* fiscal outcome but also the risk that fiscal dominance problems might re-emerge and, in particular, the private sector's expectations concerning the fiscal authorities willingness, or capacity, to resist such pressures.

This is a challenge for all countries but is particularly relevant in developing countries where the fiscal stance tends to be strongly pro-cyclical and where fiscal consolidations are hard to sustain.³⁶ Arguably these problem are magnified in resource-rich economies - - such as Uganda hopes to become -- where the interaction of 'voracity effects' arising from highly visible fiscal booms makes spending increases harder to resist during booms and spending cuts harder to push through during recessions. If access to world capital markets is similarly pro-cyclical, latent fiscal pressures will manifest itself as pressures for domestic deficit financing. When domestic debt markets are also thin the domestic debt burden can rise rapidly in response to borrowing pressures, which may raise incentives for the fiscal authorities to seek recourse to (surprise) inflation to reduce the real debt stock.

These risks raise a set of questions about the flexibility and credibility of fiscal institutions and whether the design of effective monetary frameworks necessarily requires the establishment of compatible fiscal rules, beyond the current cash budget. Conventional wisdom suggests that, beyond the flexibility delivered through automatic fiscal stabilizers, fiscal policy – and hence fiscal policy rules -- should be trained on issues of longer term debt sustainability, with short term stabilization being left to monetary policy, where variations in the fiscal stance feed into the output gap to which the monetary authorities react.

Communication and coherence

The second key challenge concerns developing robust institutions to coordinate fiscal and monetary policies and to sustain a coherent communication strategy. The legacy of the cash budget and the history of close cooperation between the Bank of Uganda and the Ministry of Finance and Economic Development, centred around the development and implementation of the MTEF, is clearly advantageous in this respect. Where further investment is required is in building the Bank of Uganda's infrastructure for the effective communication with the private sector along the lines discussed above.

Understanding the monetary transmission mechanism

The effectiveness of monetary policy, and the credibility of any regime will depend on how reliably and how quickly observable policy actions influence inflation and other real variables. In other words, effectiveness depends on the nature of the transmission mechanism and, critically, on how well it is understood since the credibility of the monetary regime will be undermined if observed policy actions are perceived to be ineffective or even have persistently perverse outcomes.

The textbook macroeconomic model, which underpins both IT frameworks and, with little modification, the more conventional monetary frameworks employed in Africa, fundamentally derives from research and experience of OECD economies such as the UK, New Zealand and Canada and mature emerging market economies such as Chile.³⁷ This model embodies a particular characterization of the transmission mechanism which tends to emphasise the conventional interest rate channels of transmission, in which short-run interest rate decisions are transmitted through a well-defined yield curve to long-term interest rates which, in turn, given inflation expectations, influence the interest-sensitive components of aggregate demand and hence moderate expected and actual inflation. In the open economy setting, where capital account openness is presumed, this effect is augmented by the exchange rate channel. Working through the interest parity conditions, higher interest rates appreciate the exchange rate which reduces net exports and thus the output gap. In addition, the exchange rate appreciation reduces the domestic cost of imports.

In Uganda, where the financial sector is much less developed these traditional transmission channels may be less powerful, while others may dominate. Moreover, transmission effects are also likely to be much less stable. The processes of structural transformation and innovation in financial markets noted above have generated shocks to velocity and the money multipliers and are likely to have substantially altered the short-to-medium-run link between money growth or nominal depreciation and domestic inflation and output. In the rest of this section I consider some of the areas where the transmission mechanism in Uganda is likely to differ from the textbook characterization.

³⁷ Labeled the 'New Keynesian Open-Economy Model, this model consists of four basic elements: (i) an open economy IS curve characterizing aggregate demand in which the output gap responds to movements in real interest rates and real exchange rate; (ii) on the supply-side a Phillips curve in which the conventional inflation-output relationship is augmented by a pass-through effect from the exchange rate; (iii) an interest parity condition; and (iv) a policy rule summarizing central bank interest rate-setting behaviour (Berg *et al*, 2006). As Adam *et al* (2008) note, this model can be readily adapted to reflect an environment in which the policy instrument is the money supply rather than the interest rate.

The interest rate channel

In industrial countries, short-term market interest rates are the main instrument of monetary policy, operating directly through interest-sensitive components of absorption and indirectly through wealth effects, by altering collateral conditions and thereby expanding or contracting bank lending. An implicit assumption is that the banking system is relatively competitive and fully lent out so that changes in the short-run policy rate are rapidly transmitted through the length of the yield curve. In Uganda, where monetary policy tends to be exercised through operations on the central bank's own balance sheet – via open market operations and foreign exchange sales – and where the banking sector is relatively oligopolistic the classical interest rate channel is less likely to be so important.

Credit channel

Nonetheless, monetary policy can alter the level of credit available to loan-dependent borrowers and affect real activity via the 'effective' cost of capital even when interest rates do not constitute an instrument of monetary policy. In the presence of credit rationing, a monetary policy that increases the loanable resources available to banks may sharply reduce the shadow cost of capital for rationed borrowers. Historically, banks in Uganda have done rather little intermediation, preferring to invest in liquid government securities and non-remunerated excess reserves. This suggests a historically weak credit channel in the transmission of monetary policy. However, as rates on government securities have declined and excess reserve holdings reduced, we might expect this channel to strengthen over time.

Exchange rate channel

Monetary policy operates through asset prices as well as through interest rates, and the exchange rate is by far the most important of these in Uganda. On the current account, exchange rate changes influence aggregate demand by generating expenditure-switching between traded and non-traded goods. Exchange rate changes also redistribute real income among sector-specific factors of production, making the exchange rate a subject of intense political concern to policymakers even if the direct aggregate demand effects of the redistribution are small. On the capital account, the same movements create capital gains or losses on assets denominated in foreign currency which, in turn, may feed through wealth effects to consumption. Although dollar-denominated deposits are widely available, commercial banks rarely hold substantial open positions, due to a combination of regulatory restrictions and caution; nor do domestic firms, given the reluctance of banks to lend domestically in foreign currency. Nonetheless, the widespread use of foreign currency and foreign currency deposits in private portfolios has at least two related implications for monetary control. First, the availability of a ready substitute for domestic money increases the sensitivity of domestic money demand to interest rates and inflation. Other things equal, the response of inflation and capital flows to money supply shocks will be quantitatively larger and may be less predictable than in the absence of dollarization. Monetary aggregates that do not include foreign currency deposits (e.g., domestic M2) but that are affected by substitution between domestic and foreign-currency denominated assets may perform poorly as indicators of inflation pressure,

relative either to narrower aggregates less affected by substitution (e.g., the monetary base) or to broader aggregates like M3 that include foreign currency deposits (Berg and Borensztein, 2000). Second, by enhancing the substitutability of domestic and foreign assets, dollarization heightens the macroeconomic importance of portfolio adjustments, both as autonomous shocks and as responses to other shocks.

Fiscal channels

Finally, although conventional interest rate channels may not be as powerful as elsewhere, interest rate effects may operate more powerfully in emerging markets through domestic debt markets onto the fiscal accounts for the reasons we discussed above. Thus central bank open market operations using government debt instruments can exert powerful real effects through the fiscal burden of interest payments. These effects may be magnified when the domestic fiscal balance is also sensitive to movements in the exchange rate as is the case in economies where revenues are highly dependent on commodity prices and/or aid flows. These fiscal channels of transmission tend not to feature in the textbook model of the transmission mechanism.

Successful monetary policy operations under an IT regime, and in the current reserve money / ‘inflation targeting lite’ regime, depends on the central bank developing a clear view on the relative strength of these different channels and the speed with which policy impulses are transmitted along each. Knowing this helps define the appropriate choice of instrument (even in an IT regime). The companion paper to this starts to make inroads into this issue by building on the recent work by the Bank of Uganda staff and the IMF.³⁸

³⁸ See for example, Atingi-Ego and Egesa (2007), Anguyo (2008) and IMF (2005).

REFERENCES

- Adam, C., S.O'Connell and E.Buffie (2008) 'Aid volatility, monetary policy rules and the capital account in African economies' *World Economy and Finance Working Paper No 37*. http://www.worldeconomyandfinance.org/working_papers_publications/wpdetail0037.htm
- Adam, C. and D. Bevan, (2003), "Staying the Course: Maintaining Fiscal Control in Developing Countries" in S. Collins and D. Rodrik (eds) *Brookings Trade Forum* (The Brookings Institution).
- Adam, C. and B.Goderis (2008) 'Monetary Policy and Oil Price Surges in Nigeria' in P.Collier, C.Pattillo and C.Soludo (eds) *Economic policy Options for a Prosperous Nigeria* (London, Macmillan).
- Anguyo, F. (2008) 'Exchange rate pass-through to inflation in Uganda: evidence from a vector error correction model'. *Bank of Uganda Working Paper WP/09/08*.
- Aron, J. and J.Muellbauer (2007) 'Review of Monetary Policy in South Africa since 1994.' *Journal of African Economies* **16** pp 705-744.
- Atingi-Ego, M. and K.A.Egesa (2008) 'Interest and exchange rate effects on output: implications for Uganda's monetary policy instrument mix'. *Bank of Uganda Working Paper WP/05/08*.
- Barro, R. and D.Gordon (1983) 'A positive theory of monetary policy in a natural rate model' *Journal of Political Economy* **91** (4) pp 589-610.
- Berg, A. and E.Borensztein (2000) 'The choice of exchange rate regime and monetary target in highly dollarized economies' *IMF Working Paper WP/00/29*.
- Berg, A. D.Laxton and P.Karam (2006) 'Practical Model-Based Monetary Policy' *IMF Working Paper WP/06/80*.
- Bernanke, B. and F.Mishkin (1997) 'Inflation Targeting: A New Framework for Monetary Policy' *Journal of Economic Perspectives* **11** (2), pp 97-116.
- Blanchard, O. and J.Gali (2007) "The macroeconomic effects of oil price shocks: why are the 2000s so different from the 1970s?" *NBER Working Paper* 13368.
- Brownbridge, M. and E.Tumusiime-Mutebile, 2006, "Aid and Fiscal Deficits: Lessons from Uganda on the Implications for Macroeconomic Management and Fiscal Sustainability" *Development Policy Review*, Vol. 25(2),pp. 193-213.
- Buffie, E., S.O'Connell and C.Adam (2009) "Fiscal Inertia, Donor Credibility and the Monetary Management of Aid Surges" (mimeo at <http://www.economics.ox.ac.uk/Members/christopher.adam/default.htm>)
- Christensen, J. (2004) 'Domestic Debt Markets in Sub-Saharan Africa' *IMF Working Paper* 04/46.

- Honohan, P., and T.Beck (2007) *Making Finance Work for Africa* (World Bank).
- IMF (2005) 'Uganda: Statistical Appendix and Selected Issues.
- IMF(2007) 'The Macroeconomics of Scaling-Up Aid: Lessons from Recent Experience' *IMF Occasional Paper 253*. (Washington, DC, IMF).
- IMF (2008a) 'Uganda: Second Review under Policy Support Instrument' *IMF Country Report 08/04*.
- IMF (2008b) 'Uganda: Third Review under Policy Support Instrument' *IMF Country Report 08/236*.
- Kydland, F. and E.Prescott (1977) 'Rules rather than discretion: the inconsistency of optimal plans' *Journal of Political Economy* **85** (3) pp 473-491.
- Mackenzie, G. and P.Stella (1996) 'Quasi-Fiscal Operations of Public Financial Institutions' *IMF Occasional Paper 142*. (Washington, DC, IMF).
- Mishkin, F. and K. Schmidt-Hebbel (2007) 'Does Inflation Targeting Make a Difference?' in Mishkin, F. and K. Schmidt-Hebbel (eds) *Monetary Policy Under Inflation Targeting* Central Bank of Chile.
- Munoz, S (2007) 'Central bank quasi-fiscal losses and high inflation in Zimbabwe: A Note' *IMF Working Paper, WP/07/98*.
- Prasad, E and R.Rajan (2008) "A pragmatic approach to capital account liberalization' *JEP* (22) 3, pp149-172.
- Stella, P (2008) 'Central Bank Financial Strength, Policy Constraints and Inflation' *IMF Working Paper WP/08/49*.
- Stone, M. (2003) 'Inflation Targeting Lite' *IMF Working Paper WP/03/12*
- Woodford, M. (2007) 'The case for forecast targeting as a monetary policy strategy' *Journal of Economic Perspectives* **21** (4) pp 3-24.