Fiscal inertia, donor credibility, and the monetary management of aid surges
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A B S T R A C T
Donors cannot pre-commit to support scaled-up public spending programs on a continuing basis, nor can governments credibly commit to curtail expenditure rapidly in the event that aid revenues contract. An aid boom may therefore be accompanied by a credibility problem. When this is the case, the absorb-and-spend strategy recommended by the IMF leads to capital flight, higher inflation, and large current account surpluses inclusive of aid. The right policy package combines a critical minimum degree of fiscal restraint with reverse sterilization.

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1. Introduction

To absorb and spend the aid would appear to be the appropriate response under “normal” circumstances. (Berg et al., 2007, p.19)

Surprisingly, a full absorb-and-spend response is not observed in any of the sample countries. (Berg et al., 2007, p.36)

In all countries, part of the aid increment was lost through reductions in the rate of capital inflow. In Ghana, the deterioration in the non-aid capital account exceeded the entire increment in the aid inflow. In Tanzania and Uganda, the reduction in the rate of non-aid capital inflows was comparable to the aid surge. (Berg et al., 2007, p.28)

Aid flows fluctuate considerably over the medium run.¹ This complicates macroeconomic management of aid booms because political realities and institutional constraints limit the use of reserve buffer stocks. In developing countries almost every branch of the public sector other than the Ministry of Finance has a long list of projects that are supposed to receive funding as soon as budgetary conditions ease. The internal pressures to spend aid money as it arrives are thus very strong. Moreover, donors are also highly averse to fiscal prudence; they want to see their money spent doing good, not piling up as reserves in central bank vaults. Economists’ counsel that the country should spend only the annuity value of the aid boom may be tolerated awhile, but if the government ignores donor sentiment for too long it could provoke a suspension of aid (Eifert and Gelb, 2005; Berg et al., 2007). As Adam and Bevan (2003) observe, “to treat aid as temporary is to risk making it so.”

Since a full-funded reserve buffer stock is policy non grata, expenditure cuts and/or tax increases are essential to maintain macroeconomic stability when aid flows decline to a normal level. Fiscal retrenchment, however, is generally slow and painful (Heller, 2005). The ends of resource and aid booms invariably witness large and persistent financing gaps as governments struggle to reverse prior spending commitments.² This reality is widely accepted in the policy world. Most IMF programs, for example, include “adjusters” that allow the fiscal deficit to increase by 50–100% of a negative aid shock (Berg et al., 2007).

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¹ Bulir and Hamann (2003, 2008) estimate aid flows to be 4–13 times more volatile than other types of fiscal revenue. In Arellano et al.’s dataset, the standard deviations of the ratio of aid to national income and of the ratio of aid commitments to disbursements are 7 and 10 times their respective means.

² See Collier and Gunning (1999), Tornei and Lane (1999), and the section on Lessons from Commodity Booms in Foster and Killick (2006).
In all likelihood the private sector is aware of the connection between aid surges and the path of the fiscal deficit. Donors cannot pre-commit to support scaled-up public spending programs on a continuing basis, nor can the government credibly commit to curtail expenditure rapidly in the event that aid revenues contract. The public has ample grounds therefore to fear that today’s aid boom threatens future fiscal stability. This adds another layer of complexity to the task facing policy makers. Success on the macroeconomic front requires not only a “fiscal exit plan” for coping with a possible aid collapse (Heller, 2005), but also a strategy for managing private sector expectations.

This paper investigates the credibility problem inherent in the interaction of aid volatility and fiscal inertia. Our analysis is structured with two objectives in mind. The positive objective is to gain a better understanding of the stylized facts associated with aid booms. Country studies recently completed at the IMF (Berg et al., 2007) and the ODI (Foster and Killick, 2006) found that the current account deficit typically increases by less than half of the rise in aid flows and that aid surges often coincide with large capital outflows. These are disconcerting correlations. The current account deficit has to increase by the same amount as aid to effect a complete transfer of resources. The case study data indicate this did not happen; most aid appeared to be financed by the sale of aid dollars, the aid boom subsequently collapses, the central bank sells the bonds it purchased earlier, maintaining control of money growth and inflation while the fiscal authorities take steps to realign spending with revenue. Thus the fiscal time bomb is no longer an inflation time bomb. The resulting shift from pessimistic to neutral expectations in the private sector repairs much of the damage done by the absorb-and-spend strategy: inflation stays below its previous level, capital outflows decrease 25%, and the absorption rate rises 10 points. Temporary fiscal restraint + reverse sterilization is not a perfect solution to the credibility problem; it does, however, go a long way toward making the problem manageable.

Our analysis is complementary to research by Lensink and Morrissey (2000), Pallage and Rube (2003), ARELLANO et al. (2009), and Celasun and Walliser (2008) on the welfare costs of aid volatility. The central finding in this literature is that the losses from induced variability in consumption and from changes in the levels of public and private investment are sizable. Our results add another item to the list of potential welfare costs: prolonged bouts of high inflation when policy makers fail to address the aid credibility problem with the right policy package.

The rest of the paper is organized into seven sections. In Sections 2 and 3 we develop an optimizing model of a small open economy and calibrate it to the data for low-income countries in Sub-Saharan Africa. Section 4 demonstrates that the absorb-and-spend approach works well when the aid boom is known to be permanent but is fraught with problems when it is expected to be temporary. Section 5 examines alternative policy responses to the credibility problem and Section 6 tests the robustness of the results to a wider range of parameter values. Section 7 concludes.

2. The Model

We extend the model in Buffe et al. (2008) to allow for temporary aid shocks and fiscal inertia. The specification of the real economy is primitive. Competitive firms produce a nontraded good and a composite traded good. Real output is fixed in both sectors, the exchange rate system is a pure float, and the world price of the traded good equals unity. On the financial side, the private sector divides its wealth between domestic currency M, foreign currency F, and government bonds B. Bonds are indexed to the price level P, so B = Bb, where Bb ≡ B/P. Other notational conventions are as follows: C is consumption and output in sector i; e is the nominal exchange rate; and Pe and E are the relative price of the nontraded good and aggregate real expenditure measured in dollars (i.e., units of the traded good).

It turns out that successful intervention requires a policy package. Operating on their own, neither fiscal nor monetary policy can resolve the country’s macroeconomic problems. Reducing expenditure and selling bonds are reflex, business-as-usual responses to inflation and capital flight. They treat the symptoms of the credibility problem but do not give the private sector any reason to alter its view that the aid boom is a fiscal and money growth time bomb. The right strategy combines a critical minimum degree of fiscal restraint with reverse sterilization. During the low-credibility phase, the government uses part of the aid inflow (≈ 25%) to cut the fiscal deficit and pay down the internal debt. Crucially, the reverse sterilization component of the package buys extra time to adjust to future adverse aid shocks. If the aid boom subsequently collapses, the central bank sells the bonds it purchased earlier, maintaining control of money growth and inflation while the fiscal authorities take steps to realign spending with revenue. Thus the fiscal time bomb is no longer an inflation time bomb. The resulting shift from pessimistic to neutral expectations in the private sector repairs much of the damage done by the absorb-and-spend strategy: inflation stays below its previous level, capital outflows decrease 25%, and the absorption rate rises 10 points. Temporary fiscal restraint + reverse sterilization is not a perfect solution to the credibility problem; it does, however, go a long way toward making the problem manageable.

For several reasons, the Fund’s conceptual framework and its interpretation of the data are problematic (more on this later). The alternative explanation advanced here is that low absorption rates and large capital outflows stem from an unsolved credibility problem. Elaborating, we show that the Fund’s preferred strategy of spending all the aid and floating the exchange rate (what the Fund calls the absorb-and-spend approach) works well when the public believes the aid surge is permanent: in the numerical simulations we report for this scenario, absorption quickly rises to 90–100%, inflation decreases 1–1.4 percentage points, and private capital outflows fluctuate between .5 and 1% of GDP. But everything goes wrong if the public fears the aid boom may be temporary and that larger fiscal deficits and rapid money growth loom on the horizon. Even though the government is committed to a full absorption policy and all extra public sector spending is financed by the sale of aid dollars, the absorption rate then drops to 35–65% while capital flight claims 30–60% of the aid inflow and inflation soars from 15% to 22–33%. The Fund is right when it asserts that absorb and spend (really float and spend) is the correct approach under “normal” circumstances. But circumstances are often not normal. When aid volatility and fiscal inertia undermine credibility, absorb and spend is a recipe for disaster.

Our second objective is to ascertain the best policy response to the credibility problem. To frame the normative analysis, we assume policy makers are unable to allay private sector concerns about the durability of aid and the government’s capacity for expeditious fiscal retraction. In this situation, the challenge for the government is to devise a strategy that keeps macroeconomic instability at bay until the passage of time reveals whether the aid boom is truly permanent.

3 See Berg et al. (2007, p. 30). The authors acknowledge that the argument is speculative and that the relationship between aid and private capital flows is not well understood: “Identifying the conditions under which aid would lead to a capital outflow or inflow is therefore a nontrivial undertaking, which is left to future work.” (p. 30).

4 The assumption of constant output is innocuous. With variable output, price changes in the nontradables sector depend on both demand and supply responses. All of the results in the paper go through with η redefined to be the sum of the compensated elasticity of demand and the general equilibrium elasticity of supply for nontradables.
2.1. Preferences and the private agent’s optimization problem

All economic decisions in the private sector are controlled by a representative agent who derives utility from consumption of traded and nontraded goods and from the liquidity services generated by holdings of domestic and foreign currency. To obtain concrete results, we assume preferences take the form

\[ U = \int_0^\infty \left[ \frac{C(C_n, C_T)}{1-1/\tau} + h \frac{\phi(M/P, eF/P)}{1-1/\tau} \right] e^{-\rho t} dt, \]

where

\[ C(C_n, C_T) = \left[ k_e C_n^{\beta-1}/\beta + k_h C_T^{\beta-1}/\beta \right] \left[ k_d C_n^{\beta-1}/\beta + k_f C_T^{\beta-1}/\beta \right]^{1/(\beta-1)}, \]

\[ \phi(M/P, eF/P) = \left[ k_e (M/P)^{\alpha-1}/\alpha + k_f (F/P)^{\alpha-1}/\alpha \right]^{1/(\alpha-1)}. \]

are linearly homogeneous CES aggregator functions; \( h \) and \( k_o-k_d \) are positive constants; \( \tau \) is the pure time preference rate; \( \tau \) is the intertemporal elasticity of substitution; \( \beta \) is the elasticity of substitution between traded and nontraded consumer goods; and \( \sigma \) is the elasticity of substitution between domestic and foreign currency.

The private agent solves his optimization problem in two stages. In the first stage, \( C_n \) and \( C_T \) are chosen to maximize \( V(C_n, C_T) \) subject to the constraint \( P_n C_n + C_T = E \). The optimal choices \( C_n \) and \( C_T \) are subsumed in the indirect utility function

\[ V(P_n, E) = C(C_n, C_T), \]

where

\[ c(P_n) = \left( k_e C_n^{\beta-1}/\beta + k_f C_T^{\beta-1}/\beta \right)^{1/(\beta-1)}. \]

As a byproduct of optimization, we get the solution for the exact consumer price index:

\[ P = e_c(P_n). \]

For future use, note also that

\[ \pi = \chi + \gamma \dot{P}_n / P_n, \]

where \( \pi = \dot{P}/P \) is the inflation rate; \( \chi = \dot{e}/e \) is the rate of currency depreciation; and \( \gamma = k_e (P_n^{\alpha-1}/\alpha) [k_d + k_f (P_n^{\beta-1}/\beta)] \) is the consumption share of the nontraded good. In the second stage of optimization, the private agent chooses asset holdings and expenditure to maximize

\[ U = \int_0^\infty \left[ \frac{\dot{P}_n^{1-1/\tau}}{1-1/\tau} + h \frac{\phi(m, F)^{1-1/\tau}}{1-1/\tau} \right] c(P_n^{1-1/\tau}) e^{-\rho t} dt, \]

subject to the wealth constraint

\[ A = m + \frac{P}{e} b + F, \]

and the budget constraint

\[ \dot{A} = P_n Q_o + Q_t + g + (r + \pi - \chi) \frac{P}{e} b - E - \chi m. \]

The Maximum Principle furnishes the necessary conditions for an optimum. These consist of

\[ E^{-1/\tau} c(P_n^{1-1/\tau}) = \omega, \]

\[ h \phi(m, F)^{1-1/\tau} \phi_n(m, F) = E^{-1/\tau} (r + \pi), \]

\[ h \phi(m, F)^{1-1/\tau} \phi_t(m, F) = E^{-1/\tau} (r + \pi - \chi), \]

\[ \omega = \omega(\rho + \chi - \pi) \]

where \( \omega \) is the multiplier attached to Eq. (5). Eqs. (6)–(8) hold no surprises. As expected, the marginal utility of consumption equals the shadow price of wealth and the marginal rate of substitution between consumption and foreign currency equals the income foregone from holding that type of money. The co-state Eq. (9) may look less familiar, but it is nothing more than a standard Euler equation. Differentiate Eq. (6) with respect to time and substitute for \( \dot{\omega} \). This gives

\[ \dot{E} / E - \gamma \dot{P}_n / P_n = \tau (r - \rho), \]

where the term on the left side is the percentage change in aggregate real consumption.

2.2. The nontradables sector

\( P_o \) adjusts to clear the goods market in the nontradables sector. This requires

\[ C_n = Q_n, \]

where \( C_n \) is retrieved from the indirect utility function by invoking Roy’s Identity

\[ C_n = - \frac{\partial V / \partial P_n}{\partial V / \partial E} = E \frac{k_e (P_n^{\alpha-1}/\alpha)}{k_d + k_f (P_n^{\beta-1}/\beta)}. \]

2.3. The public sector budget constraint

The fiscal deficit net of aid may be financed by printing money, by selling bonds, or by selling foreign exchange reserves \( Z \). For simplicity, we ignore interest earned by reserves. The consolidated public sector budget constraint is thus

\[ \dot{m} + c(P_n) b - Z = g + c(P_n) rb - X - \chi m. \]

where \( X \) is sale of aid dollars and we have substituted \( c(P_n) \) for \( P/e \).

2.4. Net foreign asset accumulation

Summing the private and public sector budget constraints produces the accounting identity that total foreign asset accumulation equals national saving or the current account surplus:

\[ \dot{F} + \dot{Z} = P_n Q_o + Q_t + X - E. \]

In a pure float, the overall balance of payments, \( Z \), is zero. The capital account deficit (\( \dot{F} \)) then equals the current account surplus inclusive of aid.

\footnote{A large and growing body of work concludes that currency substitution and private capital flows are important to the macroeconomic picture in Sub-Saharan Africa. See Fielding (1994), Asea and Reinhart (1996), Bhinda et al. (1999), Adam (1999), Henstridge (1999), Nacheva (2001), Collier et al. (2002), Fedderke and Liu (2002), International Monetary Fund (2004), and Munoz (2006).}

\footnote{It is easy to confirm that \( \gamma = P_o C_o / E \). See Eq. (12) that follows in the text.}

\footnote{Since \( \phi(\cdot) \) is homogeneous of degree one and \( P/e = c(P_n) \), the liquidity services function can be written as \( \phi(M/P, eF/P) = \phi(m/F)/c(P_n) \). Note also that the artificial capital gains term \( (\pi - \chi)/P/e \) shows up in the budget constraint because the traded good is the numeraire but bonds are indexed to the price level.}
2.5. Temporary aid surges and fiscal inertia

We use the game-theoretic analysis in O'Connell et al. (2008) to discipline the specification of aid flows and fiscal policy. To fix ideas, suppose policy makers find it difficult to distinguish between short- and long-term aid surges because temporary donors mimic permanent donors in a pooling equilibrium. When aid flows jump from $X_o$ to $X_1$ at $t = 0$, the government and the private sector conjecture that the aid surge will end at $t = T$ with probability $p$. During this low-credibility period, the government may decide to err on the side of caution and spend only a fraction of the extra money on transfers to the “poor” (i.e., the representative agent):

$$g_1 = g_o + \psi (X_1 - X_o), \quad 0 < t < T.$$  \hfill (15)

The objective of the permanent donor is to increase annual transfers to the poor by $X - X_o$. This increase equates the marginal benefit of aid for the donor to its opportunity cost. In the pooling equilibrium, however, the aid recipient has an incentive to divert some aid to a buffer stock. To discourage underspending, optimizing transfers to the poor by temporary donors is a perfectly credible threat on the part of donors in the period $t = 0$.  

The path of spending also divides at $T$. If the donor is the temporary type, aid falls back to $X_o$:

$$X(t)_{\text{temporary donor}} = X_o, \quad t > T.$$  \hfill (16b)

When the donor is the permanent type, the path depends on how much of the extra aid was spent in the preceding period $(0, T)$. Under the use-it-or-lose-it clause, the donor reduces aid to $X - (1 - \psi)(X_1 - X_o)$ for $T$ years before fixing $X$ at $X^*$:

$$X(t)_{\text{permanent donor}} = \{X^* - (1 - \psi)(X_1 - X_o), \quad T < t < 2T, \quad X^*, \quad t > 2T.$$  \hfill (16c)

The path of spending also divides at $T$. If the aid boom collapses, the government must either curtail expenditure or tolerate a higher fiscal deficit and higher inflation. We assume policy makers are averse to higher inflation but find it difficult to terminate spending programs initiated during the boom phase. Transfer payments decrease at the rate

$$\dot{g} = v (g_o - g), \quad t > T,$$  \hfill (17)

where $v > 0$ determines the degree of fiscal inertia.

When the government draws a permanent donor, transfers stay at $g_o$. In the period $T < t < 2T$, the buffer stock carried over from the low-credibility period $[2(T)] > Z_o$ or $b(T) < b_o$ pays for $(1 - \psi)(X_1 - X_o)$ of the extra spending.\footnote{There is no point in reducing transfers to avoid an increase in the primary fiscal deficit in the period $(T, 2T)$. This simply extends the length of the punishment phase.} After the “punishment phase” is over, $X = X^*$ and all extra spending is financed by extra aid.

2.6. The transition at $T$

Most of the numerical results presented in Sections 4–6 admit of straightforward intuitive explanations. The transition at $T$, however, is complicated. In a longer version of the paper available at http://mypage.iu.edu/~ebuffe, we derive the intertemporal arbitration conditions

$$E(T^-)^{1-\tau} C(P_n(T^-))^{1-\tau} = p E(T^-)^{1-\tau} C(P_n(T^-))^{1-\tau} / e_1 + (1 - p) E(T^-)^{1-\tau} C(P_n(T^-))^{1-\tau} / e_2,$$ \hfill (18)

$$E(T^-)^{1-\tau} C(P_n(T^-))^{1-\tau} = p E(T^-)^{1-\tau} C(P_n(T^-))^{1-\tau} / \tau + (1 - p) E(T^-)^{1-\tau} C(P_n(T^-))^{1-\tau} / \tau.$$ \hfill (19)

The first condition says that the ratio of the marginal utility of consumption to its price as $t \rightarrow T^-$ equals the expected ratio of the marginal utility of consumption to its price as $t \rightarrow T^T$. To see the logic of the second condition, substitute for $E(T^-)^{1-\tau} C(P_n(T^-))^{1-\tau} / \tau$ in Eqs. (18) from (19). After collecting terms, we have

$$E(T^-)^{1-\tau} C(P_n(T^-))^{1-\tau} \left[ \frac{e_1 - (e(T^-))}{e_1} \right]_{\mu \text{ of consumption at } T^-}.$$ \hfill (20)

$m$ jumps onto the appropriate saddle path at $T$. Since the nominal money supply is predetermined, the requisite jump in $m$ is achieved through a jump in the nominal exchange rate. Now compute the return to buying one dollar of the foreign currency as a jump in the nominal exchange rate. Now compute the return to buying one dollar of the foreign currency as

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$E$ and $m$ jump onto the appropriate saddle path at $T$. Since the nominal money supply is predetermined, the requisite jump in $m$ is achieved through a jump in the nominal exchange rate. Now compute the return to buying one dollar of the foreign currency as a jump in the nominal exchange rate. Now compute the return to buying one dollar of the foreign currency as

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2.8. Discussion of the model

Several aspects of the model merit discussion. First, it is not necessary to assume that uncertainty about aid flows stems from uncertainty about the donor’s type. O’Connell et al. (2008) show that donors and recipients behave in the same way when future aid flows depend on the donor’s re-election prospects or on business cycle conditions that affect the opportunity cost of aid funds. The two setups differ only in the permissible range of values for \( p \), the recipient’s prior probability of an aid reversal. The game with temporary vs. permanent donors restricts \( p \) to be less than .70; for higher values of \( p \), pooling is not a perfect Bayesian equilibrium. By contrast, in the game with a single donor and symmetric but incomplete information, \( p \) can take any value between zero and one.

Second, aid in the model is program aid, not project aid. The distinction between volatility and unpredictability motivates this choice. Both program and project aid are highly volatile; project aid is much more predictable, however, because donors usually commit to a timetable for delivery of funds once a project is approved.\(^{10}\)

Despite the difference in predictability, the macroeconomic problems involved in managing a surge in project aid are broadly similar to the problems involved in managing a surge in program aid. Project aid ceases when construction of the capital asset is completed at \( T \). What is uncertain is the path of the fiscal deficit after the LDC government assumes responsibility for recurrent costs. If the public fears that the government may not immediately cut other expenditures or increase taxes to cover higher outlays on operations and maintenance, then a surge in project aid threatens future fiscal and monetary stability. Many of the insights in the current model carry over, but the supply-side effects of project aid complicate the story and could change some of the results.\(^{11}\) The issue deserves attention in future research.

Finally, the precise form of the use-it-or-lose-it (UILi) penalty is not important. We have solved the model for two less punitive versions of UILi where the permanent donor (\( a \)) maintains the higher level of aid but requires the recipient to increase spending in the period \( (T, 2T) \) by the amount of aid hoarded in period \( (0,T) \) or (b) tolerates a modest amount of underspending in period \( (0,T) \) provided the recipient spends all aid after \( T \) (i.e., after the recipient is assured that the aid surge is permanent). These modifications produce different post-\( T \) paths for aid and the fiscal deficit in the permanent donor scenario. But the credibility problem stems from the volatility of aid flows and the difficulty of fiscal adjustment in the aftermath of an aid collapse, not from the post-\( T \) transition path with permanent aid. The results are highly robust therefore to alternative plausible specifications of UILi.

From here we proceed directly to calibration of the model. The longer version of the paper available at http://mypage.iu.edu/ebuffie explains how to solve the model.

3. Model calibration

Table 1 lists the parameter values used to calibrate the model. \( m_o, n_o, b_o, y_o \) and \( X_o \) are close to the values seen in the poorest countries in Sub-Saharan Africa, but the values for the deep parameters \( \beta, \sigma, \text{ and } \tau \) are based on econometric estimates for other LDCs. Below we comment briefly on the rationales for the numbers assigned to these parameters and to \( \rho, p \) and \( F_o \):

- **Elasticity of substitution in consumption between traded and nontraded consumer goods** (\( \beta \)). Fixing \( \beta \) at .50 implies that the compensated elasticity of demand for the nontraded good is .25 initially. This agrees with the finding in empirical studies that compensated elasticities of demand tend to be small at high levels of aggregation.\(^{12}\)

- **Elasticity of substitution between domestic and foreign currency** (\( \sigma \)). There are no reliable estimates of \( \sigma \) for any country in Africa. For Latin America the numbers range from one to seven (Ramirez-Rojas, 1985; Marquez, 1987; Giovannini and Turtleboom, 1994; Kamin and Ericsson, 1993). Not trusting the high-end estimates (??7), we decided to carry out runs for \( \sigma = .75, 1.50 \).

- **Time preference rate** (\( \rho \)). The time preference rate is 8% because the real interest rate on government debt—fixed by \( p \) across steady states—is high in countries likely to be large aid recipients.\(^{13}\)

- **Elasticity of intertemporal substitution** (\( \tau \)). Most estimates for LDCs place \( \tau \) between .10 and .50 (Agener and Montiel, 1999, Table 12.1). Since we have the poorest LDCs in mind, \( \tau \) is fixed at .25.

- **Ratio of foreign currency to national income** (\( F_o \)). Foreign currency deposits in the domestic banking sector range from 50% to 200% of reserve money in Ghana, Mozambique, Tanzania, and Uganda. In addition, a good deal of foreign currency is held outside of the domestic banking system. We arbitrarily set \( F_o \) at .15. This is in line with dollarization ratios in other parts of the Third World.\(^{14}\)

- **Degree of fiscal inertia** (\( v \)). Most runs assume \( v = 1 \). This implies an intermediate degree of fiscal inertia: 87% of spending increases introduced during the aid boom are reversed within two years. In the benchmark model, we also present results for a low degree of fiscal inertia (\( v = .50 \)) where it takes four years to cut spending 87%.

- **Size of the aid surge**. The data presented in Bulir and Lane (2004) and Bulir and Hamann (2008) suggest that unpredictable aid surges are on the order of 1–4% of GDP.\(^{15}\) Aid flows are also known to be more unpredictable in poor, highly aid-dependent countries. We fixed the aid surge therefore at 3% of national income.

- **Probability of an aid reversal** (\( p \)). \( p = .65 \) to reflect the high volatility of aid flows. Section 6 investigates the outcomes for \( p = .25 \) and \( = .90 \).

4. Aid booms with and without credibility

Absorption depends on the response of the central bank ... The combination of absorption and spending chosen by the authorities defines the macroeconomic response to aid. (International Monetary Fund, 2007, p.2)

The IMF uses a spend and absorb framework to classify macroeconomic responses to an aid boom. Spend is defined to be the increase in

\(^{10}\) See Bulir and Lane (2004) and Celasun and Walliser (2008) for evidence that program aid is far more unpredictable than project aid. (Celasun and Walliser observe that the predictability of program/budget aid is “strikingly low.”) The relative importance of the two types of aid varies across countries. Program aid is a large share of total aid, however, in Sub-Saharan Africa. It accounts for roughly 50% of total aid, for example, in Tanzania, Sierra Leone, Uganda, Rwanda, and Mozambique (Celasun and Walliser, 2008).

\(^{11}\) Growth in productive capacity following completion of the project may blunt inflationary pressures for several years, buying the government a grace period for fiscal adjustment. But if the project crowds-in private investment, demand growth may outstrip supply growth in the short and medium run. Moreover, the scope for combating the credibility problem with a buffer stock scheme is reduced to the extent that aid-financed projects are not fungible with other projects the government intends to undertake.

\(^{12}\) See Lluch et al. (1977, chapter 3), Deaton and Muellbauer (1980, p.71), Blundell (1988, p.35), and Blundell, Pashardes, and Weber (1993, Table 3b, p.581).

\(^{13}\) In Ghana, for example, the IMF (2003, p.66) reports that short-term treasury bills have paid an average real interest rate of 8.25% since 1992.

\(^{14}\) See Kamin and Ericsson (1993), Savastano (1996), and Balino, Bennett, and Borenstein (1999).

\(^{15}\) In Bulir and Lane (2004), the difference between median aid projections and median aid disbursements ranges from 1.4% to 2.9% of GDP for program aid. In the dataset Bulir and Hamann (2008) assembled for 76 countries, the average maximum aid inflow exceeds the average mean level of aid by 5.6% of GDP. Not all of the 5.6% difference, however, reflects prediction error.
the primary fiscal deficit and absorb the increase in the current account deficit, both measured as a percentage of the increase in aid. The IMF recommends that the central bank sell all the aid dollars and that the central government spend all the counterpart funds (i.e., the domestic currency proceeds of the aid). It calls this the absorb-and-spend approach. Absorb is treated as a policy variable on the assumption that aggregate absorption is determined by the central bank’s willingness to sell aid dollars. This is a stretch, however. Since the current account depends on how private sector spending responds to the aid inflow, absorption is an endogenous variable, not a policy instrument. At the risk of violating the IMF’s property rights, we relabel their approach float and full spend (FFS hereafter).

In this section we conduct a counterfactual exercise to test the sensitivity of the IMF’s FFS strategy to credibility of the aid boom. The numerical simulations track the paths of inflation, the real exchange rate, the current account surplus inclusive of aid, private capital flows, and the absorption rate.

### 4.1. FFS with full credibility

Table 2 shows the outcome when the aid boom is permanent with probability one. In the long run, spending increases by the full amount of extra currency and the inflation tax (mm) adjusts to cover any change in the fiscal deficit. The increase in expenditures raises the demand for nontraded goods and real money balances. Across steady states, this causes the real exchange rate to appreciate 11% and the inflation rate raises from 8% to 9%.

In high-inflation economies, the Fund also endorses an absorb-and-spend approach in which part of the extra aid is used to reduce domestic financing of the fiscal deficit.

16 When the exchange rate floats and the capital account is closed, the trade deficit equals sales of foreign exchange by the central bank as assumed in the Fund’s absorb and spend framework (Micozzi, 2007). This is a special and unrealistic case, however.

17 Since the integral of the current account surplus over the year equals the increase in holdings of foreign currency, the annual absorption rate is measured by \( 1 - \frac{F(t) - F(t-1)}{0.03}. \) (National income equals unity initially, so the absolute increase in aid is 0.03.) The cumulative absorption rate through year 1 equals \( 1 - \frac{F(t) - F(0)}{0.03}. \)

### 4.2. FFS without credibility

Over the medium and longer term, once a government scales up its expenditure program in response to more foreign aid, it faces the challenge of how to finance these programs if the new aid isn’t sustained by donors. Such obligations are not easily shed or reduced. If governments are not able to reduce expenditures, budgetary policy pressures may jeopardize the macroeconomic policy framework. (Heller, 2005, p. 12)

Credibility is the Achilles’ heel of the FFS strategy. In Tables 3 and 4 the public fears an aid collapse at year three and a subsequent transitory phase of high fiscal deficits and high inflation. Naturally, this creates inflationary pressures during the boom period by reducing money demand. At \( t = 0 \), the price level jumps 2–15% and inflation increases from 15% to 18–25%. Following this bad start, things deteriorate further. Inflation rises monotonically, reaching 22–34% at the end of year three. When the resolution of uncertainty reveals a temporary donor, the currency depreciates 12–28%, the price level jumps 11–26%, and inflation soars to 31–60%.

Observe also that private capital outflows are very large and that absorption is far less than 100%. For \( v = 1 \), the private sector spends only 58–65% of aid-generated income; this figure drops to 46–59% when fiscal inertia is high. Disturbingly, in a pure float, the flip side of low absorption and large current account surpluses (inclusive of aid) has to be extensive capital flight. In the worst-case scenario where \( \sigma = 1.50 \) and \( v = 0.50 \), 54% of aid is wasted in paying for capital flight during the surge period. Not all of this is the fault of FFS. Some worsening in the capital account is unavoidable because the private sector saves to smooth the impact of a temporary aid shock on consumption. But the pure saving motive accounts for only 30–50% of the outflows.

The rest—which is

---

**Table 1**

<table>
<thead>
<tr>
<th>Parameter/variable</th>
<th>Assigned value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserve money (m)</td>
<td>10% of GNP</td>
</tr>
<tr>
<td>Inflation (( \pi ))</td>
<td>15%</td>
</tr>
<tr>
<td>Stock of internal debt (b)</td>
<td>10% of GNP</td>
</tr>
<tr>
<td>Consumption share of nontraded good (( \gamma ))</td>
<td>50%</td>
</tr>
<tr>
<td>Aid (( X ))</td>
<td>10% of GNP</td>
</tr>
<tr>
<td>Degree of fiscal inertia (( v ))</td>
<td>0.50, 1</td>
</tr>
<tr>
<td>Time preference rate (( r ))</td>
<td>0.85</td>
</tr>
<tr>
<td>Foreign currency (F)</td>
<td>15% of GNP</td>
</tr>
<tr>
<td>Elasticity of substitution between traded and nontraded consumer goods (( \beta ))</td>
<td>0.75, 1.50</td>
</tr>
<tr>
<td>Elasticity of substitution between domestic and foreign currency (( \sigma ))</td>
<td>0.25</td>
</tr>
<tr>
<td>Intertemporal elasticity of substitution (( \tau ))</td>
<td>3% of GNP</td>
</tr>
<tr>
<td>Prior probability of an aid reversal (( P ))</td>
<td>0.65</td>
</tr>
</tbody>
</table>

**Table 2**

<table>
<thead>
<tr>
<th>t</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Long run</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \sigma )</td>
<td>0.75</td>
<td>1.0</td>
<td>1.3</td>
<td>1.5</td>
<td>1.7</td>
<td>1.9</td>
<td>2.0</td>
</tr>
<tr>
<td>( \pi )</td>
<td>0.144</td>
<td>0.142</td>
<td>0.141</td>
<td>0.140</td>
<td>0.140</td>
<td>0.139</td>
<td>0.138</td>
</tr>
<tr>
<td>( r )</td>
<td>0.888</td>
<td>0.885</td>
<td>0.883</td>
<td>0.882</td>
<td>0.881</td>
<td>0.881</td>
<td>0.881</td>
</tr>
<tr>
<td>RER</td>
<td>91</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>89</td>
<td>89</td>
</tr>
<tr>
<td>CA</td>
<td>0.004</td>
<td>0.0028</td>
<td>0.0018</td>
<td>0.0012</td>
<td>0.0008</td>
<td>0.0005</td>
<td>0</td>
</tr>
<tr>
<td>CCF</td>
<td>0</td>
<td>0.0037</td>
<td>0.0062</td>
<td>0.0079</td>
<td>0.0090</td>
<td>0.0097</td>
<td>0.011</td>
</tr>
<tr>
<td>AR</td>
<td>–</td>
<td>0.85</td>
<td>0.90</td>
<td>0.91</td>
<td>0.93</td>
<td>0.94</td>
<td>1</td>
</tr>
<tr>
<td>( \sigma )</td>
<td>1.50</td>
<td>1.75</td>
<td>2.00</td>
<td>2.25</td>
<td>2.50</td>
<td>2.75</td>
<td>3.00</td>
</tr>
<tr>
<td>( \pi )</td>
<td>0.139</td>
<td>0.138</td>
<td>0.137</td>
<td>0.137</td>
<td>0.137</td>
<td>0.136</td>
<td>0.136</td>
</tr>
<tr>
<td>( r )</td>
<td>0.883</td>
<td>0.882</td>
<td>0.881</td>
<td>0.881</td>
<td>0.881</td>
<td>0.880</td>
<td>0.880</td>
</tr>
<tr>
<td>RER</td>
<td>90</td>
<td>89</td>
<td>89</td>
<td>89</td>
<td>89</td>
<td>89</td>
<td>89</td>
</tr>
<tr>
<td>CA</td>
<td>0.0017</td>
<td>0.0012</td>
<td>0.0009</td>
<td>0.0006</td>
<td>0.0004</td>
<td>0.0003</td>
<td>0</td>
</tr>
<tr>
<td>CCF</td>
<td>0</td>
<td>0.0016</td>
<td>0.0027</td>
<td>0.0035</td>
<td>0.0041</td>
<td>0.0045</td>
<td>0.0054</td>
</tr>
<tr>
<td>AR</td>
<td>–</td>
<td>0.85</td>
<td>0.90</td>
<td>0.91</td>
<td>0.93</td>
<td>0.94</td>
<td>1</td>
</tr>
</tbody>
</table>

Notation: \( n, \pi, RER, \) CA, CCF, and AR stand for the inflation rate, the real interest rate, the real exchange rate, the ratio of the current account surplus to initial national income, the ratio of cumulative capital flows to initial national income, and the absorption rate. The initial values for the FFS strategy, the real interest rate, the real exchange rate, and the current account are 15%, 0.1, and 0.
Accordingly, we move on to examine tight money, temporary credibility. This raises the question of whether other policies do better.

5. Policy options

The default policy, FFS, fares poorly when the aid boom is not temporary/permanent.

The fault of FFS—reflects the public’s desire to amass foreign currency as a hedge against inflation.

It would be easy to read these results as supporting the Fund’s contention that spending in excess of absorption fuels higher inflation and capital flight. The right conclusion, however, is quite different. The Fund’s conceptual framework and its interpretation of the empirical evidence rest on the premises that (i) absorption is a policy variable and (ii) the money supply increases ex ante when the central bank does not allow absorption to rise by the same amount as the fiscal deficit. Neither premise is valid in our model. There is no increase in the money supply, ex ante or ex post, and absorption is endogenous because foreign currency is a vehicle for private saving. The government aims for full absorption, but this is not feasible when the private sector fears that the current aid boom portends future fiscal and monetary instability. In Tables 3 and 4, low absorption, capital flight, and high inflation are symptoms of an unsolved credibility problem. Bad policy is not to blame.

5.1. Tight money

Weak credibility stokes inflationary pressure by depressing money demand. In this section, the central bank reacts by selling securities to reduce money growth:

\[ \dot{b} = \alpha |b(t) - b_0|, \quad \alpha > 0, \quad t < T. \]  

(21)

Let \( J \equiv b(0) - b_0 \) denote bond sales at \( t = 0 \). The path for \( b \) is then

\[ b(t) = b_0 + Je^{\alpha t}, \quad t < T. \]  

(22)

The values assigned to \( J \) and \( \alpha \) define the central bank’s tight money rule. We search over these two parameters to find the policy rule that delivers the best results. This is not meant to be realistic. It is rather a debating tactic: we want to demonstrate that tight money is the wrong policy even under assumptions favorable to its success.

The introduction of bond sales alters a couple of equations in the model. During the low-credibility period, part of the fiscal deficit is financed by issuing debt. The public sector budget constraint changes to

\[ m = g_1 + c(P_n)rb - X^* - c(P_n)\alpha |b(t) - b_0| - \chi m, \quad t < T. \]  

(13')

Bond sales cease at \( T \). When aid is temporary, the government reduces expenditure gradually to bring the fiscal deficit and inflation back to their original levels.\(^{22}\) This requires more fiscal adjustment than in the benchmark model. Transfer payments have to drop below \( g_0 \) in order to offset higher interest payments on the internal debt:

\[ \dot{g} = v(\bar{g} - g), \quad v > 0, \]  

(17c)

where

\[ \bar{g} = g_0 - \frac{p(b(T) - b_0)}{\alpha}. \]

Table 5 shows the limits of monetary policy acting on its own. What stands out in the comparison with the counterfactual (FFS with \( v = 1 \)) is the almost complete futility of tight money. Inflation is lower in the first two years but higher in years three and four. There is only one achievement worthy of note: tight money eliminates the nasty spike in the price level at the start of the aid boom.

\(^{21}\) Heller et al. (2006) recognize the fiscal credibility problem. This section can be viewed as a response to their appeal for analysis of “self-protection” policies that “use aid inflows in a way to increase the resilience of the economy in the event of future aid shortfalls...” (p21).

\(^{22}\) In the case of permanent aid, we assume the central bank slowly repurchases the debt sold in period (0, T). (At \( t = T \), \( \alpha \) changes from a positive number to \( -0.001 \).) The solution paths are virtually identical under the alternative assumption that none of the debt is redeemed after year \( T \).
These results are not particularly surprising. Tight money tries to neutralize inflationary pressure and inhibit capital flight by aligning money growth with money demand. This is sensible, intuitive, and simplistic. Bond sales imply higher interest payments in the future and even larger fiscal deficits after the aid boom disappears. Viewed from this angle, the tight money strategy is ill-conceived; it slows money growth but exacerbates the credibility/fiscal inertia problem.

5.2. Temporary fiscal restraint

Under a policy of temporary fiscal restraint, the government spends less than 100% of the extra aid while credibility is low:

\[ g_1 = g_o + \psi(X_1 - X_o), \quad 0 < \psi < 1, \ t < T. \] (15)

The primary fiscal deficit decreases by \((1 - \psi)(X_1 - X_o)\), the portion of aid not spent. This reduces money growth without compromising the fiscal discipline of the retardation period when and if the aid boom collapses. Ceteris paribus, therefore, inflationary pressures should be less than in the counterfactual scenario.

Unfortunately, there is a catch. Because of use-it-or-lose-it, the scenario with a permanent donor now includes an intermediate phase \((T, 2T)\) in which the fiscal deficit and money growth are higher.\(^{23}\) More difficult adjustment on this transition path offsets some of the gains from lower money growth during the low-credibility phase. It is not clear ex ante therefore that temporary fiscal restraint enhances overall macroeconomic stability. But perhaps there is a presumption of net stabilization gains for plausible parameter values?

The answer in Table 6 is discouraging. Fiscal restraint helps only for a couple of years. \(\psi = .75\), there is not enough restraint to sustain absorption and inhibit capital outflows after year one or to stop inflation from rising to 18–24% in year three.\(^{24}\) Moreover, temporary control of inflation is achieved by importing a new problem. Battered by incipient capital inflows, the nominal exchange rate appreciates 18–25% at \(t = 0\). Consequently, to keep demand equal to supply, the nominal price of the nontradable good has to decrease increasingly by 8–12%. This is a bit far-fetched. If prices are not exceptionally flexible in the downward direction, adjustment will be accompanied by a demand-switching recession in the nontradables sector (Buffie et al., 2008).

\(^{23}\) Before the aid boom, the primary fiscal deficit was \(g_o - X_o\). In the period \((T, 2T)\), this increases to \(g_o + (1 - \psi)(X_1 - X_o) - X_o\).

\(^{24}\) Note also that there are large upward jumps in the exchange rate and the price level when \(\sigma = 1.50\) and aid is temporary.
Table 6  
Transition path with temporary fiscal restraint.

<table>
<thead>
<tr>
<th>t = 0</th>
<th>t = 1</th>
<th>t = 2</th>
<th>t = 3</th>
<th>t = 3*</th>
<th>% change in ε, F₀ and P at t = 3</th>
<th>% change in ε, F₀ and P at t = 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>α = .75 and φ = .75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>π</td>
<td>.10 (.18)</td>
<td>.12 (.19)</td>
<td>.16 (.20)</td>
<td>.24 (.24)</td>
<td>.31, .24, .32, .13</td>
<td>e = 2.4, −4.6 (e = 12.5, −19.6)</td>
</tr>
<tr>
<td>r</td>
<td>.082</td>
<td>.081</td>
<td>.081</td>
<td>.086</td>
<td>.081, .078</td>
<td>F₀ = −.2, .2 (P₀ = 8.5, −13.4)</td>
</tr>
<tr>
<td>RER</td>
<td>.89</td>
<td>.89</td>
<td>.90</td>
<td>.92</td>
<td>.95, .88</td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td>.010</td>
<td>.011</td>
<td>.014</td>
<td>.020</td>
<td>−.013, −.013</td>
<td>P = −1.1, −2.2 (P = 10.5, −16.5)</td>
</tr>
<tr>
<td>CCF</td>
<td>0</td>
<td>.010</td>
<td>.023</td>
<td>.039</td>
<td>.039</td>
<td></td>
</tr>
<tr>
<td>AR</td>
<td>−</td>
<td>.75 (.63)</td>
<td>.72 (.65)</td>
<td>.56 (.65)</td>
<td>−</td>
<td></td>
</tr>
<tr>
<td>α = 1.50 and φ = .75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>π</td>
<td>.08 (.20)</td>
<td>.10 (.21)</td>
<td>.13 (.21)</td>
<td>.18 (.22)</td>
<td>.32, .19 (31.12)</td>
<td>e = 13.2, −21.3 (e = 15.8, −23.4)</td>
</tr>
<tr>
<td>r</td>
<td>.080</td>
<td>.085</td>
<td>.092</td>
<td>.102</td>
<td>.103, .072</td>
<td>F₀ = 7.9, −13.0 (P₀ = 11.1, −16.6)</td>
</tr>
<tr>
<td>RER</td>
<td>.86</td>
<td>.88</td>
<td>.90</td>
<td>.93</td>
<td>.98, .84</td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td>.001</td>
<td>.007</td>
<td>.013</td>
<td>.021</td>
<td>−.005, −.016</td>
<td>P = 10.5, −17.1 (P = 13.3, −19.9)</td>
</tr>
<tr>
<td>CCF</td>
<td>0</td>
<td>.004</td>
<td>.013</td>
<td>.030</td>
<td>.030</td>
<td></td>
</tr>
<tr>
<td>AR</td>
<td>−</td>
<td>.91 (.53)</td>
<td>.83 (.56)</td>
<td>.75 (.58)</td>
<td>−</td>
<td></td>
</tr>
</tbody>
</table>

The numbers in parentheses in the rows for π and AR show the outcome for FFS with ν = 1.

Eq. (28) can be written as

\[ \dot{m} = (g₀ + p₀X₀) - c(Pₐ)/(bₜ − b(T))e^{−\nu(t−T)} \]

The first term is the fiscal deficit before the aid surge and the second is the change in real interest payments on the internal debt measured in dollars. Strictly speaking, we cannot say anything about the latter term without closed-form solutions for r and c(Pₐ)/Pₑ. But while Pₑ is close to unity after the aid reversal, b(T) is at least 20% lower than b₀; hence Pₑ is invariably less than b₀. Furthermore, intuition argues that consumption smoothing by the private agent will be accompanied by declining consumption and a continuously lower real interest rate after T.26 Thus

\[ \psi(X₀ − Xₜ)e^{−\nu(T)} − c(Pₐ)/(b₀ − b(T))e^{−\nu(T)} \leq 0 \rightarrow 6\dot{e}^{−\nu(T)} \]

is almost sufficient to guarantee m(t) ≤ nₜ, t ≥ T. This condition holds for all t ≥ T if

\[ \psi(X₀ − Xₜ)/b₀ − b(T) \leq 6 \leq ν \]

(30)

When 6 = ν and b₀ − b(T) = (1 − ψ)(X₀ − Xₜ)T, so that the buffer stock equals the amount of unspent aid in the period 0, T), the condition in Eq. (30) collapses to

\[ \psi \leq \nu T − νT \frac{1}{1 + \nu} \]

It is equally easy to derive a joint restriction on 6 and ψ that virtually guarantees lower inflation for t > T and a permanent donor.27 In the case at hand where ν = 1 and T = 3, 75% of aid is spent during

26 The Euler Eq. (10) reads r = ρ + (E/E − x₀/Pₐ)T, where the term in parentheses is the instantaneous rate of change of aggregate real consumption. Before T, the private agent adds to its holdings of foreign assets by consuming less than income (inclusive of aid). After T, consumption is above the level of income but falling. When consumption is falling over time, r < 0.

27 The simplest strategy is to set 6 so that almost all of the buffer stock is used up by time 2T. This ensures that the buffer stock is used to control money growth during the period (T, 2T) when the primary fiscal deficit is temporarily high.

28 Another problem with appealing to the FFS results is that no country followed the FFS strategy.
The government buys back internal debt, equal to 3% of initial GNP at the end of year three. Throughout the punishment phase, sale of foreign exchange reserves neutralizes the reduction in aid money growth and the path of the exchange rate: during the low-credibility period. Should the aid bonanza disappear at the outset and at the time of collapse.

Table 7 shows the outcome when the government spends 75% of the aid. For the most part, the strategy succeeds. Inflation stays between 14% and 15% and the nominal exchange rate appreciates only 8% at $t=0$, avoiding the need for price decreases to clear the nontradables market. On the other hand, the absorption rate is slightly less than in the benchmark model. All of this runs in reverse for $p = 0.09^{29}$. Inflation at $t = 3$ rises from 22–33% to 27–48% and the cumulative absorption rate decreases from 46–58% to 30–45%, but the spikes in the price level and the exchange rate are much smaller following an aid collapse.

Table 8 shows the outcome when $\sigma = .75$, 75% of the aid is spent, and the central bank runs a reserve buffer stock.

6. Sensitivity analysis

We have subjected each of the scenarios in Sections 4 and 5 to a wide-ranging sensitivity analysis. The numbers in Table 9 for the FFS scenario are indicative of how alternative parameter values affect the outcome in other scenarios. Four results stand out:

1. Aid reversals are more (less) traumatic when their probability of occurrence is low (high). Inflation increases less and absorption is significantly higher during the low-credibility period when $p$ drops from .65 to .25. Note also, however, that actual aid reversals are more traumatic: since an aid collapse is a bigger surprise, the increases in the price level and the exchange rate at $t=3$ are 2\% times as large as in the benchmark model. All of this runs in reverse for $p = 0.90^{29}$. Inflation at $t = 3$ rises from 22–33% to 27–48% and the cumulative absorption rate decreases from 46–58% to 30–45%, but the spikes in the price level and the exchange rate are much smaller following an aid collapse.

2. Higher capital mobility increases the costs of low credibility. When $\delta = 3$, capital outflows are more sensitive to expectations of higher inflation and hence low credibility inflicts more damage than in the benchmark model. The absorption rate drops to 36–56%, and the price level, the exchange rate, and the inflation rate increase much more both at the outset and at the time of collapse.

3. Absorption is insensitive to the intertemporal elasticity of substitution. Higher values of $\tau$ diminish the incentive to save during the low-credibility period. The effect is very weak, however. Doubling $\tau$ increases the absorption rate only 9–15%. This reflects a point emphasized earlier: private saving is driven mainly by the desire to accumulate foreign currency as a hedge against future inflation; the root cause of low absorption is low credibility.

4. Both absorption and inflation are sensitive to the expected duration of the aid surge. The urgency to acquire foreign assets through saving and through substitution away from domestic assets is much greater when an aid collapse looms at $t=1$ instead of $t=3$.

There are slight changes in the government budget constraint and the equation for net foreign asset accumulation. See the longer version of the paper for details.

\[ 29 \] Political economy pressures can explain full spending of aid even when the probability of an aid reversal is extremely high.
Consequently, the price level, the exchange rate, and inflation increase another 6–17 percentage points at $t = 0$, while the absorption rate sinks to 21–37%.

7. Concluding remarks

Aid flows are highly volatile. This would not be a source of macroeconomic trouble if donors were amenable to full-fledged buffer stock schemes or if African governments could quickly reduce spending when aid flows contract. More often than not, however, donors insist that aid be spent right away. When prior spending commitments are hard to reverse, the recipient country then faces a potentially serious credibility problem. If the public fears that the aid boom might be temporary, it also fears that the future might bring a period of large fiscal deficits and high inflation while the government struggles to curtail expenditure. According to our numerical simulations, the fear of a contingent fiscal time bomb leads to high inflation, capital outflows, and current account surpluses (inclusive of aid) during the aid boom. This is consistent with patterns in the data and with the general reluctance of governments in SSA to spend 100% of higher aid flows.

We investigated various policy responses to the credibility problem. Tight monetary policy and fiscal restraint are ineffective as they do nothing to counteract the fear that a sudden decline in aid flows will be inflationary. The right strategy is to dedicate a small fraction of aid (20–25%) to reserve accumulation or to deficit reduction supported by purchases of internal debt. Both policy packages create a financial cushion that enables the government to control money growth when aid flows contract and the fiscal deficit rises. Inflation stays low during the aid boom because the fiscal time bomb is no longer an inflation time bomb.

References
