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Policy Responses to Aid Surges in Countries with Limited International Capital Mobility: The Role of the Exchange Rate Regime

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Summary. — We study the role of the exchange rate regime, reserve accumulation, and sterilization policies in the macroeconomics of aid surges. Absent sterilization, a peg allows for almost full aid absorption—an increase in the current account deficit net of aid—delivering the same effects as those of a flexible regime but with a necessary increase in inflation. Regardless of the regime, policies that limit absorption and result in large accumulation of reserves—are welfare reducing: they help reduce the real appreciation (and inflation under the peg), but at the expense of reducing private consumption and investment, and therefore medium-term growth.

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1. INTRODUCTION

The macroeconomic effects of aid flows have been the subject of an extensive and ongoing debate in both policy and academic circles. Many have argued that, despite the external financing constraints these flows help alleviate—and the public infrastructure they can help pay for—aid surges can hurt growth by inducing real exchange rate appreciation pressures, to the detriment of growth-promoting exporting industries.¹

In practice, these concerns have triggered policy responses that have influenced the actual effects of aid. In a canonical aid transaction, the foreign exchange (FX) accrues to the government, which sells it to the central bank in exchange for a local currency deposit, which is then drawn down as the government spends the aid. With a managed float, the central bank in turn decides whether to use the FX to accumulate foreign reserves, and if so whether such accumulation should be sterilized. Berg *et al.* (2007) document how, during aid surge episodes in several African countries with managed floats (Ghana, Mozambique, Tanzania, and Uganda), concerns about real appreciation resulted in large accumulations of reserves. This policy response may have helped contain the appreciation pressures. But it also resulted in a peculiar situation in which the aid was used twice: once to increase government spending, and once to increase the stock of reserves. The private sector was crowded out as a result, mainly through higher interest rates (when the accumulation was sterilized) and in some cases also through the inflation tax (when otherwise).

The crucial role of the central bank in the macroeconomics of aid has received little attention in the academic literature until recently.² Indeed, most previous work on the topic is built on the standard treatment of the *transfer problem*, which assumes that, to the extent the aid is being fully spent, it must also result in higher domestic absorption (an increase in the current account deficit net of aid), and by extension that aid cannot be both spent and saved as international reserves at the same time.³ While this assumption would be viable if the public sector—the direct recipient of the aid—was a single entity, it no longer holds once it is acknowledged that the public sector consists of two separate institutions: the government and the central bank. This duality makes the distinction between spending and absorbing the aid crucial. While the former is determined by fiscal policy, the latter is influenced by

the reserve policy of the central bank, especially when capital mobility is limited. In practice there is no institutional arrangement that ensures coordination between the two policies, thus allowing for the *spending without absorbing* policy mix described above.⁴

In previous works, Berg, Mirzoev, Portillo, and Zanna (2010) and Berg, Gottschalk, Portillo, and Zanna (2010) have used this typology to model the effects of aid surges—episodes of large and persistent yet temporary increases in aid—under managed floats, in both the short and medium term. Berg, Mirzoev, *et al.* (2010) developed a tractable new-Keynesian model with traded and non-traded goods to study short-run effects. Unlike the predictions of the standard transfer problem analysis, these authors showed that a policy of spending but not absorbing the aid can result in both a real and nominal depreciation if the resulting demand pressures, due to the fiscal expansion, are strong enough to threaten external balance. This can be the case even if the accumulation of reserves is fully sterilized (their default assumption in managed floats). Berg, Gottschalk, *et al.* (2010) extended the model to allow for endogenous capital accumulation, production externalities in the export sector, and possible inefficiencies in the conversion of public investment into public capital. When aid is both spent and absorbed, the model predicted a sizeable nominal and real appreciation, sectoral reallocations between the traded and the non-traded sector, and a crowding-in of private investment due to the positive effects of higher infrastructure on the returns to private capital. Instead, when aid is spent but not absorbed, the policy mix can have negative medium-term effects on growth and on welfare because of the crowding out of private investment.⁵

In this paper, we both extend and simplify the model in Berg, Gottschalk, *et al.* (2010) to study the role of the

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exchange rate regime, and the resulting policy options central banks have at their disposal, in shaping the effects of aid surges. We answer a number of questions. First, are the macroeconomic effects of aid different in fixed versus flexible (managed floats) regimes? Second, what impact do sterilization policies (in pegs) have on aid absorption? Third, what are the welfare implications of alternative policy responses, under either flexible or fixed exchange rates?

Understanding the role of the exchange rate regime in the macroeconomics of aid is, in our opinion, of first-order importance. First, sub-Saharan Africa is evenly divided between pegs and managed floats: 23 of the 44 countries covered by the African department of the IMF have a *de jure* fixed exchange rate regime, while the rest have some type of managed float (see Berg & Portillo, 2008, chap. II). Second, the importance of aid for both fiscal and balance of payment support cuts across exchange rate regimes, and concerns with the effects of aid are as pervasive in countries with managed floats, e.g., as discussed in Berg *et al.* (2007), as in hard pegs, e.g., the CFA zone, as documented by Ouattara and Strobl (2008). To our knowledge, this is the first paper that provides a systematic treatment of the exchange rate regime in the macroeconomics of aid from a spending/absorption perspective.

In principle, the ability to influence aid absorption in pegs is limited because the central bank does not have control over its reserve accumulation. In practice, limited capital mobility (a pervasive feature of low-income countries) provides an additional degree of freedom, which is embodied in the central bank's ability to sterilize (or not) any reserve accumulation that follows from the defense of the peg. Assuming that the government spends the aid as it accrues, we study two stylized responses by the central bank: sterilizing or not sterilizing the endogenous accumulation of reserves. For flexible (managed) regimes, on the other hand, we assume the central bank can accumulate aid as reserves and study the macroeconomic consequences of doing so.

Our findings are the following, based on a calibration of the model that captures a representative sub-Saharan African country:

First, a policy of limited or no sterilization allows for almost (but slightly less than) full absorption of the aid surge and sizeable real appreciation. This is the aid analog of the specie-flow mechanism that dates back to Hume. The initial increase in liquidity that results from spending the aid domestically fuels aggregate demand, inflation, and imports, which are then financed with the aid-related FX. The end result is similar to the case of no reserve accumulation in a managed float. Just like in the managed float, the economy experiences a real appreciation and an increase in private consumption, investment, and output. Unlike the managed float, the real appreciation is achieved via an increase in inflation, which can only come about through higher aggregate demand pressures in the short run. The increase in inflation also requires some accumulation of reserves to help accommodate the increase in demand for nominal money balances, which explains why absorption is less than complete.

Second, a policy of complete sterilization in a peg can greatly limit inflation and the real appreciation but at the cost of limiting absorption and crowding out the private sector, similar to a policy of deliberately accumulating aid in reserves in a float. Out of concern for the increase in inflation, either because it signals aggregate demand pressures or because it amounts to a real appreciation and therefore a potential loss of competitiveness, the central bank may decide to engage in open-market operations that limit the initial increase in liquidity. By doing so, the central bank is raising real interest rates and forcing

the private sector to reduce its spending, which then limits the demand for imports and helps support the accumulation of reserves. The end result is less inflation and a less appreciated real exchange rate, but at the cost of crowding out private investment and affecting output in the medium term.

Third, like in the managed float case, the ability to influence absorption and the real exchange rate is reduced in a fixed regime as international capital mobility increases. This is a well-known result, which is often restated more generally as the inability of the central bank to control short-run inflation in a peg when the capital account is perfectly open. One surprising result from our model is that, even without restrictive monetary policy, the positive effects of aid on private consumption, private investment, and real output can disappear once international capital mobility increases significantly. The reason is that the open capital account activates the uncovered interest parity condition, generating a strong link between domestic real interest rates and expected real depreciation. As the real exchange rate overshoots in the short-run relative to its future value—because the aid surge is temporary—the expected future depreciation acts as a drag on private consumption and investment and increases capital outflows. While we do not wish to overemphasize this result, since it is sensitive to the specific calibration we use, it indicates the real possibility of capital flight in response to the aid surge.⁶

In sum, much of the drama that is present in response to aid surges in managed floats is equally present under fixed exchange rate regimes, with the additional complication that higher inflation is necessary for the aid to be absorbed. Because there are potential trade-offs between inflation (under no sterilization) and private sector crowding out (under full sterilization) in a peg, we therefore undertake a welfare analysis as a selection criterion for sterilization policies under a fixed and for reserve accumulation policies in managed floats.

The welfare analysis yields a number of interesting findings. First, in our model, policies that encourage aid absorption are welfare dominant, regardless of the exchange rate regime: it is preferable to allow the country as a whole to use the aid-related FX, rather than having it sit in an account in New York. For this reason, in the case of a peg, a policy of no sterilization largely dominates a policy of complete sterilization, while in the case of a managed float, a policy of no reserve accumulation dominates a policy of full reserve accumulation. Second, policies that result in aid absorption have similar welfare effects under pegs and flexible exchange rates, although flexible exchange rates regime are slightly superior. This is because flexible exchange rate regimes can absorb aid with a much smaller aggregate demand boom than pegs, which instead need the boom—the increase in inflation—for aid absorption. At the other end of the spectrum, policies that result in limited aid absorption have larger negative effects on welfare in pegs than in managed floats, mainly because they have larger effects on private investment. Third, for pegs, only when the degree of sterilization reaches a high enough share of the reserve accumulation does this policy limit the degree of aid absorption and, therefore, results in a significant reduction in welfare. This suggests that what matters for aid absorption under a peg is that there is some monetary policy expansion—in order to encourage the private sector to increase its demand for imports.

Previous works in the aid literature have explored some of the policy issues we discuss in this paper. Adam, O'Connell, Buffie, and Pattillo (2009), Buffie, Adam, O'Connell, and Pattillo (2004, 2008), and Buffie, O'Connell, and Adam (2010) have extensively analyzed the role of monetary policy and exchange rate regimes in the context of aid surges. However,

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