STRUCTURAL ADJUSTMENT IN THE FRANC ZONE
THE CASE OF MALI

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Rapidly increasing foreign debt and expansionary monetary policies have led to an unsustainable macroeconomic situation in Mali. This paper analyzes Mali’s macroeconomic policies, and its impact on the real economy. Special consideration is given to the implications of Mali’s membership in the Franc Zone. The analysis is used to generate specific recommendations for macroeconomic policy for inclusion into an adjustment framework.

The main arguments made in the paper are: (a) the debt service burden in Franc Zone countries should be measured by a debt service/budgetary revenue ratio, and not by the debt service ratio; (b) even highly concessional money is quite costly for Mali, due to an externality problem; (c) deficits on the operations account can be traced to expansionary credit policies; and (d) the rapid increase in foreign borrowing in the late seventies did not influence the real exchange rate, but was reflected in growing imports.

These arguments are supported by statistical analysis and the simulation of a simple borrowing model. Drawing on this analysis, a concluding policy section examines what elements should be included into an adjustment framework, and makes specific policy recommendations.
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Structural Adjustment in the Franc Zone

The Case of Mali

1. Introduction

Mali is a landlocked sahelian country with a population of eight million people. Despite its poor resource endowment, Mali's growth has averaged 4.4 percent annually over the last 20 years or so. This impressive growth was driven by a growing agricultural sector and growth in services. Industrial growth was only 0.6 percent, below sub-saharan average. With population growing at 2.8 percent, real per capita income has increased by 1.5 percent per year. Nevertheless, Mali remains among the poorest countries in the world, with a per capita income of US$ 140 per year in 1985.

More than half of Mali's GDP comes from agriculture; services contribute 36 percent to GDP, while industry and mining account for only 12 percent of GDP. The small size of the industrial sector is partly explained by long transportation lines, which mean that Mali has to spend 10 percent of its income on transportation and insurance. Accordingly, industrial activities are mainly resource based, i.e. the processing of agricultural products. As other African countries, Mali has a dual labor market with abundant supply of unskilled labor and scarcity of skilled workers. Differential income opportunities have led to a net emigration rate of .5 percent of population per year.

The focus of this paper are macroeconomic adjustment issues. Mali's growth has been achieved partly by extensive use of concessional foreign resources; in addition, significant borrowings from the IMF were undertaken during the eighties. As a result, Mali is now faced with the challenge of safeguarding growth while adjusting to a rapidly increasing debt service. There is a second adjustment issue for the more medium term. Current account deficits exceeding aid inflows have been financed increasingly through overdrafts on the operations account. To the extent this facility is not available on a sustained basis, Mali will have to curtail domestic absorption.

The paper is organized as follows. The adjustment needs are identified in Chapter 2. In Chapter 3 we analyze the policies leading to the present situation. Their impact on Mali's competitive position is presented in Chapter 4. Finally, Chapter 5 discusses policy options and examines the Bank's role in the adjustment process.

2. Adjustment Needs

In this Chapter Mali's main problem is identified as excess absorption. Higher expenditure than income stems from Mali's borrowing behavior and from expansionary credit policies. Accordingly, two adjustment
needs are distinguished. One results from the pressure rapidly rising debt service is putting on the government budget. The other may result from policies designed to curb borrowing on the operations account.

2.1. Measurement of Debt Service Capacity

Adjustment pressures in Mali do not take the form of scarcity of foreign exchange or of balance of payments crises, as they do in many other countries. This is due to Mali's membership in the West African Monetary Union (Union Monetaire Ouest Africaine, UMOA). Member countries use a common currency, the CFA Franc, which is pegged to the French Franc at a rate of 50 CFAF:1FF; their reserves are pooled through their common central bank (Banque Centrale des Etats d'Afrique de l'Ouest, BCEAO) and deposited with the French Tresor in the operations account (compte d'operations). Convertibility of the CFAF is assured by France's willingness to provide overdraft facilities on this account, i.e., balance of payment loans. While the agreement between France and the UMOA countries contains safeguards to limit the use of this credit line, these are not automatic, but require discretionary changes in monetary policy. This means that UMOA countries are able to run sustained balance of payments deficits if France, which is represented on the board of BCEAO, is willing to accumulate claims on BCEAO. The scope for balance of payments support for an individual country of the zone is even greater. It can draw first on positive reserves of other countries before the union as a whole becomes debtor on the operations account.

The balance of payments situation is, therefore, never a direct constraint on union members' policies. An important corollary of this analysis is that the debt service ratio is not a very useful measure for indicating debt service capacity.

In Mali, as in other Franc Zone countries, adjustment needs first show up as rising debt service in the consolidated government budget. Policies are sustainable in the longer term only if government can mobilize domestic resources for debt service. While in other countries budget deficits can be financed by the inflation tax, member countries of the UMOA are bound by strict limits on government borrowing from the Central Bank. BCEAO's holding of government debt is limited to 20 percent of government revenues. For Mali, which has attained the 20 percent ceiling, this means that monetizing of debt is limited by revenue growth, which translates on average to 2 percent of expenditures and .25 percent of GDP. The above suggests the ratio of debt service to revenues as an useful measure of debt service capacity.

An analogy may be useful for understanding Mali's situation. Mali could be conceived of as a municipality in France. Its binding constraint

1/ For a detailed description of the workings of the West African Monetary Union, see GUILLAUMONT [1984] and BHATIA [1985].

2/ Debt service in Mali, as in other Franc Zone countries, is delegated to the Caisse Autonome d'Amortissement, a government agency with special earmarked taxes, and is not included in the central government budget.
is the requirement that receipts cover expenditures. The government would
correctly take the budget as the focal point of policy discussion, and would
not be concerned about balance of payment effects. The current account may
show a structural deficit, as could be the case for a poor municipality in
southern France. This would be of no concern, though, since this deficit
can persist as long as the municipality receives transfers or loans from
other parts of France. When these end, the current account deficit
vanishes. Where countries with own currencies experience balance of
payments crises, the municipality would simply recognize that its current
expenditures are too high in relation to receipts, and would have to raise
taxes or sell assets. That is, the municipality would have budgetary
problems, but no balance of payments constraints. It would also not be
concerned with monetary policy, over which it has no influence. It would
assume that its price level is mainly determined by direct price links, and
that it would hardly change if the Bank of France tightened credit
selectively to this municipality. It would perhaps lobby for preferential
discount rates, or, in a world with credit ceilings, for higher credit
ceilings than other municipalities, but would rightly regard these measures
as a means to effect transfer payments to a poor municipality.

2.2. Rising Debt Service

To a large extent, Mali has used foreign aid to finance its
development effort. In fact, official development assistance to Mali is one
of the highest in the world. In 1984, it amounted to 32 percent of GDP, of
which 59 percent were in the form of grants. 95 percent of Mali’s
outstanding debt is on highly concessional terms, with an average interest
rate of 2 percent and an average maturity of 34 years. These favorable
terms have kept debt service at manageable levels throughout the seventies,
despite high debt/GDP ratios, which reached over 80 percent in 1986.

The debt service/revenue ratio stayed below 10 percent until 1983,
but rose quickly thereafter to 25 percent in 1985 (see graph). This
increase was partly due to the end of the grace period for multilateral
loans. However, at the same time disbursements increased even more. This
did not alleviate the pressures on the government’s budget, though, as they
were tied to projects and could not be tapped by the government for debt
service. The impact of the increase in the debt service/revenue ratio was
cushioned by borrowing under three successive standbys from the IMF, debt
rescheduling, and arrears. Debt service is projected to remain high for the
foreseeable future (see graph). The graph shows two scenarios. If debt to
all creditors is serviced, the debt service/revenue ratio will reach more
than 30 percent in 1990. If debt service to China and the USSR is excluded,
the ratio would decline gradually to below 20 percent in 1990. The
structure of scheduled debt service is shown in the graph. Under both
scenarios Mali will need to adjust to the higher debt service by a)
increasing revenues; b) cutting expenditures; c) new borrowing; d) obtaining
debt relief; and/or e) accumulating arrears. These options are analyzed
below.
Debt Service Payments
1987

- Suppliers (4.7%)
- IMF Standby (23.1%)
- Multilaterals (22.4%)
- Bilaterals (38.5%)
- IDA (4.5%)
- Banks (6.8%)
Debt Service Projections

Debt Service/Revenues
2.3. Deficits on the Operations Account

A less immediate, though perhaps more fundamental, adjustment need
is likely to arise over the medium term. While it is true that the balance
of payments is no direct constraint for Mali, France may not tolerate
sustained and increasing deficits on the operations account.

Traditionally, Mali has relied on balance of payments support from
France on the operations account. From 1968 until its reentering in the
West African Monetary Union in 1984, it had a separate operations account
with the French Tresor. During this period, Mali borrowed through this
facility in every year except 1977. By 1984, its total debt on the
operations account had attained US$ 143 million, or 12.5 percent of total
debt outstanding and disbursed and 13 percent of GDP. The graph shows
Mali's deficit on the operations account since 1968.

With Mali's reentry into UMOA in 1984 France converted the
overdraft on the operations account into a long term concessional loan.
Until 1984, the Governor of Mali's Central Bank was French, and the amount
of resources transferred after the first oil price shock was about one
percent of GDP per year on average. Under the Fund program after 1981
borrowing of this order of magnitude continued. However, with the overrun
of Fund targets in the second half of 1986, Mali drew CFAF 13.5 billion on
the operations account in 1986, or 2.4 percent of GDP. Over the next four
years, repayments to the IMF alone average one percent of GDP. These
repayments are made directly by the BCEAO, and thus automatically roll over
Fund credit with overdrafts on the operations account. In addition,
high absorption in relation to income will put additional pressure on the
operations account. Policies aimed at reducing domestic absorption on
French demand can be expected. Planning for ways to adapt to such a policy
stance seems therefore appropriate.

3. Policies Leading to Present Adjustment Needs

This chapter examines the policies which have led to present
adjustment needs. We argue that present debt service "problems" can be
interpreted as an integral part of rational borrowing behavior. Monetary
policy, too, can be seen in this light. However, it is also related to the
accommodation of inefficient micropolicies.

One explanation for present debt service problems focuses on Mali's
policy of maximizing foreign assistance, without medium term planning for
debt service implications of capital inflows. In fact, the amortization
fund (GAA) has only recently started (with Bank assistance) to establish a
computerized debt data base capable of projecting future debt service.

As a result, total credit from BCEAO to government is likely to increase
beyond its statutory limit. In principle, the government would have to
repay loans to the BCEAO. It certainly will have its right to future
borrowings suspended as long as it stays beyond the statutory limit.
This represents a loss of 2% of annual receipts.
Deficit on the Operations Account
Mali, 1988 - 1986

[Graph showing deficit in the Operations Account from 1968 to 1986.]
Between 1983 and 1985 the debt service/revenue ratio rose from below 10 to 30 percent. No budgetary provisions had been made for rising debt service, and the government reacted by additional borrowing and arrears. Expenditure growth for 1986 and 1987, too, shows no adjustments to higher debt service obligations.

While planning seems to have been weak, there is a second explanation of Mali's behavior. We argue that present debt service problems can be seen as the result of rational borrowing behavior. To make this point, we first focus on the relationship between external borrowing and resource transfers. Second, we analyze the sustainability of borrowings by examining the links between debt service and the rate of return of additional borrowing. This leads to conclusions somewhat different from traditional analysis, and provides guidance for lending policy formulation.

3.1. Borrowing and Resource Transfers

Economists tend to assume an intertemporal budget constraint for the economy (see, e.g. MCDONALD [1982] or SACHS and COHEN [1982]). In this view, foreign savings are used for domestic investment, and are paid back using the increased output these investments generate. We argue that this paradigm is not adequate to explain Mali's behavior. In fact, we think that Mali's borrowing should not be regarded as a temporary inflow of foreign resources, which have to be paid back, but as a positive stream of transfers of indefinite duration.

To see this, consider the following. The rate of growth of Mali's foreign debt is \( \alpha = (dD/dt)(1/D) \). Interest on debt is \( iD \). Net resource transfers in any period are defined as the difference between net borrowing and interest paid on debt outstanding and disbursed:

\[
I = dD/dt - iD = (\alpha - i)D.
\]

Initially, assume that donors ration credit so as to stabilize the DOD/GDP ratio. As a result, debt will grow at the same rate as GDP, or \( \alpha = g \). The important question is whether \( g \) is bigger than \( i \) or not. If \( g \geq i \), Mali will receive net resource inflows of indefinite duration; in effect, loans then become gifts. Under this condition, the profitability criterion that the rate of return on foreign financed investments has to cover at least its opportunity costs is no longer relevant. Gifts never can become too big (as long as they do not lead to negative value added, of course).

Now we allow the DOD/GDP ratio to vary and solve for changes in the debt/GDP ratio compatible with positive resource transfers. Assume that transfers are zero in every period, i.e. \( \alpha = i \). Then DOD will grow by \( i \). The change in DOD/GDP is given by

\[
R/R_{-1} = \frac{(DOD/GDP)}{(DOD_{-1}/GDP_{-1})} = \frac{(1+i)/(1+g)}.
\]

Subtracting one yields the change in the debt/GDP ratio compatible with zero transfers:

\[
\Delta R/R_{-1} = (i-g)/(1+g).
\]
Mali's nominal GDP growth rate over the last 20 years has been 13 percent, while the average rate of interest is estimated at below 3 percent. Using these figures, we find that Mali receives positive transfers if \( \Delta R/R_{-1} \geq -9\% \). In the past, the fall in Mali's debt/GDP ratio has never exceeded -5%. Resource transfers were always positive. Therefore, it makes sense for Mali to regard foreign borrowing as net transfers. Welfare maximization then calls for maximization of the net present value of these transfers.

To infer from the above rational borrowing behavior, one has to pay attention to the fact that there is no international equivalent of domestic bankruptcy law. Claims on sovereign borrowers are not enforceable (see, e.g., NIEHANS [1984]). In this situation, the net present value of foreign inflows is maximized by servicing debt only when the value of these inflows is positive. While in many countries default on a part of total debt will trigger a stop of all new disbursements, Mali is facing a segmented "credit market". Effective default (disguised as arrears, or debt under renegotiation) on part of the debt does not seem to have consequences for disbursements by other donors, especially when these are in a different political grouping.

Mali's debt service behavior is consistent with this theory. She has made almost no payments to China, the USSR, and other bilateral donors which are either unlikely to provide new money or provide it regardless of service of debt outstanding; debt to multilaterals, and notably the World Bank, which have been responsible for the increase in inflows since 1978, has been serviced on the whole. Repurchases to the Fund are made directly by the BCEAO and do not depend on government action.

3.2. Sustainability

The analysis above looks at borrowing from a balance of payments point of view. While it gives useful insights into the nature of external borrowing by Mali, it bypasses the question of whether such borrowing is sustainable or not. We have argued that Mali's relevant policy constraint is the government budget. In this section we address the sustainability question by developing a model of the budgetary impact of additional borrowing.

The model (for a detailed description see Appendix A) analyzes the budgetary impact of additional borrowing in year \( t=0 \) in subsequent years. Expenditures will rise due to interest and amortization of the additional debt. On the other hand, revenues will increase since projects with positive rates of return will contribute to GDP growth. The crucial parameters are a) additional debt service payments \( \delta(t) \); b) the initial ratio of debt service to revenues \( \gamma \); c) the economy's marginal tax rate \( \alpha \); d) the size of additional borrowing expressed as a fraction of GDP \( \beta \); and e) the nominal interest rate \( i \). We define borrowing policies to be sustainable if they keep the debt service/revenue ratio constant.
Therefore, our basic assumption is that additional borrowing should not increase the debt service/revenue ratio. To focus on the main point, we do not incorporate exchange rate changes. However, this can easily be done. The model is solved for the required rate of return of the additional borrowing, and for the required GDP growth rate. The required annualized rate of return is in any period given as:

$$\frac{\Delta Y_t}{\Delta D_0} = \left(\frac{\delta(t)}{\alpha \gamma}\right)^{1/t}.$$ 

This can be reformulated into the required annualized GDP growth rate which is needed over trend growth to keep the debt service/revenue ratio constant:

$$g + \pi = \left(\frac{\beta \delta(t)}{\alpha \gamma + 1}\right)^{1/t} - 1.$$

Note that both formulas are in nominal terms. The model was simulated with the following parameters for Mali:

- a) Maturity: 34 years
- b) Grace period: 7 years
- c) $i = 0.02$
- d) $\alpha = 0.14$
- e) $\gamma = 0.1$
- f) $\beta = 0.08$.

These values give a stylized picture of the end seventies and early eighties. The results are presented in graphs below. In interpreting the simulations, note that the model is formulated in incremental form: the graphs show additional GDP growth needed for additional borrowing in one single year. If such additional borrowing is done over several years, the time profiles of additional GDP growth needed have to be added.

The size of rates of return and of additional GDP growth required to keep the debt service/revenue ratio constant seem puzzling at first. Additional borrowing of 8 percent of GDP in 1978 would have required an internal rate of return of 19.5 percent by 1987, and additional GDP growth of more than 3 percent. These rates appear to be very high, and indicate that Mali’s borrowing behavior is not sustainable over the longer run. The explanation for the size of necessary additional GDP growth is simple. The apparent contradiction between debt crisis and highly concessional money can be explained in terms of an externality. Foreign savings are used to finance investment, and the increased output these investments generate is used to repay the loans. The problem in Mali as in many other African countries is that the benefits of increased output accrues mainly to private agents, while the costs, i.e. the debt service, is borne by the government. The government captures only part of the benefits in form of increased taxation. Seen in this light, even highly concessional money appears to be quite costly for Mali. We come back to this point in section 5.

Having established that Mali’s past borrowing behavior has been unsustainable, we are now have the elements to tackle the question of whether Mali should have undertaken these borrowings or not. Above we have argued that from a resource point of view Mali should maximize the net

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4/ This assumption is less restrictive than it may appear, because our model allows to vary this ratio exogenously for scenario analysis. In steady state this ratio is constant.
Annual Additional GDP Growth Required
for DS/REV to remain constant

Required Annualized Rate of Return
for DS/REV to remain constant
present value of resource inflows. This is consistent with unsustainable borrowing only if "overshooting" does not depress the future borrowing path below its sustainable level. The important question therefore is whether overborrowing with subsequent partial default, restructuring, or arrears will depress long run capital flows below the level Mali would otherwise have experienced. We do not have a definite answer, but it appears as if most donors are willing to maintain net resource transfers at a considerable level, provided Mali implements some adjustment measures. We doubt that past borrowing was done in a planned fashion, so that one could speak of a borrowing strategy, but at present it cannot be ruled out that rational planning would have led to the same behavior.

3.3. Welfare Maximization

Even if we assume for the moment that short run maximization of resource transfers was consistent with maximization of the net present value of transfers, it is not said that Mali's behavior was optimal from a welfare point of view. This has to do with resource allocation. While emphasizing the volume of net inflows, Mali has paid less attention to efficient resource allocation. There has been no institutional mechanism to evaluate development projects with regard to development priorities or economic rates of return. As a result, the allocation of the bulk of public spending has been decided by donors.5/ As detailed in the Public Expenditure Review (WORLD BANK [1987]), this has led, inter alia, a) to the financing of low priority projects with low rates of economic return; b) to excessive capital expenditure in relation to maintenance, causing degradation of existing assets and contributing to low returns of existing capacity; c) to investment levels which seem out of line with the limited capacity of the government to operate and maintain capital assets. Apart from abundant anecdotal evidence, this shows up in aggregate data.

From 1968 to 1977, growth averaged 4.6 percent, and the investment ratio was 15.6 percent with a resulting ICOR of 3.3. Between 1977 and 1986 the investment ratio increased to 25.2 percent, and GDP growth fell to 4.1 percent annually.6/ The 85 percent rise of the ICOR to 6.1 indicates that the use of the additional inflows was less efficient. Mali could have improved its welfare by channeling these resources into priority projects and maintenance of existing assets. While the scope for reallocation of funds is limited by donor preferences, Mali has hardly tried to influence the allocation process.

5/ 60 percent of total public expenditure is not included in the consolidated budget, and is mainly externally financed, project-oriented development expenditures.

6/ This includes the drought years 1983 to 1985, but also 1986 when real growth was 9.6 percent. The investment figures used are development expenditures which contain consumption components. Estimations for revised investment data are currently being undertaken. While these would change the level of the ICOR calculated, it is unlikely that they would influence the change of the ICOR.
Investment and Growth

1968-1986

V77jIGDP

[Image of a bar chart showing investment and growth rates for 1968-77 and 1977-86, with different symbols representing L/GDP, Annual Growth Rate, and ICOR.]
3.4. Overdrafts on the Operations Account

Overdrafts on the operations account are basically a monetary phenomenon. In a fixed exchange rate regime with an open capital account the money stock is endogenous. Money supply is determined by money demand. Any excess money demand will be satisfied by capital inflows, while excess growth of domestic credit will be reflected in declining net foreign assets. The graph below pictures this relationship for Mali. All variables are expressed in months of GDP. Money stock is fairly constant at about 3 months of GDP, the same ratio as for many other countries. Net domestic credit and net foreign assets are almost mirror images: a rise in net domestic credit leads to a corresponding fall in net foreign assets, and vice versa. With perfect capital mobility one would expect that an increase in domestic credit would be offset by a capital outflow of equal size. In this case monetary policy could not influence domestic activity or domestic prices. If, on the other hand, domestic and foreign securities are less than perfect substitutes, an offset coefficient of less than one would be expected, and would indicate that domestic credit influences domestic activity and the domestic price level to some extent.

Our empirical estimates are presented in Appendix B. According to our estimation, an increase in domestic credit of one CFAF will lead to a capital outflow of .62 CFAF. This confirms theoretical reasoning and graphical evidence. Changes in net domestic credit are indeed the major determinant of Mali's net foreign assets position. Thus, we can state that expansionary credit policies from 1968 to 1986 were the main cause for borrowings on the operations account. Note that from 1976 on net domestic credit growth has been lower than GDP growth, resulting in a decline in the NFA/GDP ratio. Nevertheless, borrowing on the operations account was still positive over these years, but was restricted to below GDP growth. The estimated offset coefficient is significantly different from one. This indicates that monetary policy can influence domestic activity to some extent. We return to this point in Chapter 5.

One explanation for this expansionary policy stance has been given in Chapter 2. Institutional arrangements suggest that monetary policy may have been used to transfer resources to Mali.

A second explanation focuses on the role of the public enterprise sector and government. Since her socialist experiment from 1962 to 1968, Mali has been relying heavily on public enterprises for production, distribution, and trade of goods. Investment, pricing, and employment decisions often were not undertaken on efficiency grounds, but for "strategic reasons", or to pursue other policy goals. For example, hirings seem to have been made with a view to provide income support for the urban, higher educated population; also, the rural population has been taxed until recently through pricing policies to provide subsidies to urban areas, and especially civil servants and the military. Considerable deficits in the public and public enterprise sector have been the result. Shown below is the evolution of the consolidated government budget deficit (excluding public enterprises and donor-financed investment). The graph shows clearly the reduction of the deficit under the IMF standby.
Domestic Credit and Net Foreign Assets

Mali, 1968–1986

Money/GDP + Credit/GDP

Consolidated Government Deficit

percent of GDP
Information on deficits of public enterprises is not available on a consistent basis. Nine state enterprises (out of a total of more than 50) had a consolidated deficit of CFAF 12.6 billion in 1980, or 4.6 percent of GDP. Deficits for 12 major public enterprises averaged 1.2 percent of GDP from 1982 to 1985.

These deficits have been financed by channeling 70 percent of private sector credit to public enterprises via the state owned development bank (BDM, Banque du Developpement du Mali). As a result, BDM accumulated bad loans. When France converted Mali's overdraft on the operations account into a long term concessional loan with her reentry into UMOA, CFAF 37 billion of this conversion constituted bad loans to public enterprises. The government is now paying the subsidies to PEs in the form of increased debt service. It is estimated that in 1986 BDM had CFAF 24.3 billion of bad loans, or about twice its capital base.

While these policies have led to an inefficient resource allocation and have thus depressed growth below its potential, we are mainly interested in their implications for monetary policy. Public enterprises rely on credit from BDM to finance their deficits; BDM, in turn, accumulates bad debts. In this situation, stricter monetary policies quickly cause liquidity crises, making the insolvency of BDM and major enterprises apparent. Under present conditions, such a liquidity crisis would be especially severe. Mali's other banks have invested significant parts of their funds in the money market, where BDM is a net borrower. Illiquidity by BDM would thus have a major impact on the liquidity situation of the other banks. We argue that expansionary monetary policies in the past can partly be explained by the desire to avoid such a situation. Expansionary monetary policy, which first may have been pursued with a view to channel funds to Mali, made the financing of an inefficient state enterprise sector feasible. Now, the very existence of this sector in turn imposes a serious constraint on monetary policies.

4. Changes in Mali's Competitive Position

In this chapter the evolution of Mali's real exchange rate is analyzed. It turns out that Mali's competitive position vis-a-vis major trading partners has not worsened, but that she has lost ground vis-a-vis the world's most important cotton producers countries. Mali's borrowing strategy does not seem to have influenced the real exchange rate. The terms of trade experienced a dramatic deterioration over the period under review.

The real exchange rate is defined here as the relative price between tradables and non-tradables. Since it is an endogenous variable in the economic system, it cannot be over- or undervalued except for short time periods. The real exchange rate can be thought of as an indicator of new technologies, or government policies, or any other changes in the economic environment. This view of the real exchange rate would not regard real exchange rate changes as undesirable. However, it would monitor this rate closely to identify adjustment needs to changed economic conditions; it also would monitor the real exchange rate to detect side effects of government policies.
For example, increased borrowing may lead to an immediate real appreciation, thus inducing the expectation of a higher depreciation of the real exchange rate over time. This increases the true costs of foreign borrowing, as MARTIN and SELOWSKY [1984] have argued, and should therefore be taken into account when making borrowing decisions. A real appreciation means a fall in the relative price of tradables to non-tradables. To economic agents this signals to withdraw resources from export and import-substitution industries. To the extent that Mali’s government is concerned about encouraging these activities, it will be interested in monitoring closely the effects of its borrowing activities.

For Mali, we basically calculate three different measures of the real effective exchange rate. The first serves to evaluate the competitiveness of Mali’s import-substitution activities, and is import-weighted by the ten major trading partners. Due to its landlocked situation and long transportation lines, Mali spends 10 percent of its GDP on transportation and insurance. Therefore, one potential for growth in non-cotton exports can be seen in exports to neighboring countries. Mali’s competitive position in these markets is captured by an export weighted REER vis-a-vis surrounding Franc Zone countries. Mali’s biggest foreign exchange earner is cotton. To assess Mali’s position in the world cotton market, we calculate a REER to nine major cotton producer countries, weighted by world market share.

Non-tradables prices are approximated by Mali’s GDP deflator. With exports about 20 percent of GDP, this index seems reasonable; also, there is no other reliable index available. The import-weighted index uses the foreign WPI to approximate for tradables, following a suggestion by EDWARDS [1985]. The export market REER uses foreign CPIs due to data availability. In the cotton REER the CPI is used to proxy for cost pressures, since there are no adequate wage data for Mali. The following graph shows different measures of Mali’s real exchange rate.

All measures indicate that there has not been a pronounced real appreciation over the last 18 years. Quite to the contrary, Mali seems to have experienced a slight depreciation over these years. The import and export weighted REERs show, with the exception of 1973/74, an almost continuous depreciation until 1983. If anything, Mali’s competitive position for import-substituting industries and exporting industries to neighboring countries has improved until 1983. After 1983, Mali’s real rate started to appreciate and has resulted, for exports to surrounding countries, in a slight loss of competitiveness. If this trend were to continue, it would signal difficulties ahead, especially when seen in the light of terms of trade changes. As the graph shows, Mali’s terms of trade have deteriorated by 50 percent since 1968, a fall which has not been reflected in real exchange rate changes. If EPD projections would materialize, Mali would experience over the coming years a real appreciation of unprecedented size, and some policy action would clearly be called for.

The picture for the cotton sector is shown in the following graph. Mali’s real exchange rate against major cotton producer countries has appreciated by more than 30 percent between 1968 and 1979. After a dramatic depreciation between 1979 and 1984, Mali’s real rate has been appreciating again since 1984. If China, which emerged during the eighties as a major
Terms of Trade
Malaysia 1968–1986

The graph illustrates the terms of trade for Malaysia from 1968 to 1986. The y-axis represents the terms index, with 100 as the base year (1966). The x-axis shows the years from 1968 to 1986. The terms of trade show a general declining trend, indicating a decrease in the terms of trade for Malaysia during this period.
### Different Measures of Mali's Real Exchange Rate

<table>
<thead>
<tr>
<th>Year</th>
<th>REER 1</th>
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<th>REER 3</th>
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<td>123.10</td>
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**REER 1:** Import weighted, 10 major trading partners, using CPI.  
**REER 2:** As REER 1, but using WPI for partner countries.  
**REER 3:** Export weighted, 5 surrounding Franc Zone countries, using CPI.  
**REER 4:** Bilateral Real Rate vis-a-vis France, using CPI.  
**REER 5:** As REER 4, but using WPI.  
**REER 6:** Against 9 major cotton producers, world market share weighted, using CPI.  
**REER 7:** As REER 6, but including China (CPI for China is available only after 1975).

Price index for Mali is GDP deflator from IMF REDs. No other reliable indices are available for Mali.

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producer, is included, Mali's cotton REER is now back to its 1980 level. These figures indicate that Mali's problems in 1986, due to low world market prices for cotton, may have been more than just temporary. If one considers the US-dollar appreciation during the eighties exceptional, then it seems that Mali's competitive position in the cotton sector is deteriorating over the longer term.

As argued above, for policy making it is interesting to know whether additional borrowing leads to a real appreciation or not. If it does, this raises the real costs of borrowing and can suggest to lower the level of borrowing. We test for this relationship in Appendix C. Our results show no influence of resource inflows on the real exchange rate.
Two explanations can be advanced for this result. First, most capital inflows are going into specific projects; due to the early development stage of Mali’s industry, this means that a large part of this money is either used for employing foreign construction companies, or for paying for project-related imports. For example, 63.5 percent of IDA money is paid directly to foreign suppliers. Moreover, additional domestic income tends to be spent partly on imports; the import ratio is 40 percent. According to our estimations (see Appendix D), 90 percent of capital inflows, defined as net MLT of the Bank’s debt data base and official transfers, are spent on imports. The resulting demand pressures on the domestic economy are therefore small. Second, the non-tradables sector in Mali, excluding government services, may show a high supply elasticity, as would be expected for activities like trading, transport, and basic construction. The nontradables sector in Mali is 40 percent of GDP, and trade, transport and other services, which are assumed to have a high supply elasticity, are 28 percent of GDP. Data to test the high supply elasticity hypothesis, however, were not available.

5. Policy Conclusions

In this paper we have argued that Mali’s main problem is excessive absorption, which gives rise to two macroeconomic adjustment issues. One is the pressure rapidly rising debt service is putting on the government budget. The second is deficits on the operations account, which may lead to stricter monetary policies in the future. Building on the above analysis, this chapter explores what Mali should do to maximize its welfare. It analyzes policy options, and then proceeds to identify the implications of these policies for Bank strategy.

5.1. Borrowing Strategy

As the analysis in chapter 3 has shown, Mali’s "debt service problems" can be explained as the result of rational behavior. Since loans to Mali are in effect net transfers, the profitability criterion becomes irrelevant. Mali’s optimal strategy is to maximize these transfers regardless of their productivity. Such a strategy calls for defaults on loans where the net present value of future payments is negative. A necessary condition for donors to prevent default is therefore to maintain a positive transfer stream to Mali. However, this condition is not sufficient. Mali has to finance debt service out of the current budget. Optimally, Mali will do so only if the economic and political costs of raising the funds for debt service are lower than future expected benefits, again economic and political. This shifts the attention to a) the benefits donor-financed projects are providing for Mali, and b) the debt service/revenue ratio. The latter is of particular importance, since it is reasonable to postulate that the costs of debt service rise with an increasing debt service/revenue ratio, and are the higher the faster this ratio increases. Borrowings are sustainable in the longer term if their return generates the additional funds for debt service, so that the debt
service/revenue ratio remains constant. This requires amortization and interest payments to grow at the same rate as revenues (balanced growth).

Three conclusions can be drawn from this analysis. First, the balanced growth rule has clearly been violated in the past, and overshooting over the optimal growth path has occurred. In their effort to transfer sizeable amounts of resources to low income Mali, many donors seem to have been unaware of the debt service implications of their lending policy. Servicing all debt now would constitute a considerable burden for Mali, which would most likely fall on maintenance expenditures and thus would contribute to degradation of existing assets. Also, we think there is a strong distributional case for debt relief (compare FISCHER [1987]). It is in the mutual interest to go beyond mere rescheduling, and to recognize the transfer character of past loans. The decision-making process of the donor community should be helped by the recognition that in the past they have not paid attention to the basic rule described above which is necessary for the long term viability of Mali’s borrowing activities. If debt relief does not come by agreement, Mali would probably take the first step.

Second, implications of our analysis for future lending have to be considered. It has been shown that the debt service burden of even highly concessional money is considerable. Projects have to generate the budgetary resources for interest and amortization payments. Our analysis indicates that present levels of new lending are unsustainable at present terms, and would inevitably lead to a new debt crisis in the future. The choice for donors is between lowering the amount of resource transfers, providing more of these resources as outright grants, and improving "cost recovery".

Third, it is also important for donors to realize that appropriate levels of lending to Mali cannot be determined individually. This is due to the external effect that increased lending by one donor limits possible future debt service to other donors. In such a situation, donor coordination becomes extremely important.

5.2. Resource Allocation

While it is true that Mali’s interest lies in maximizing resource inflows, this says nothing about the optimal allocation of these resources. Mali’s choice is between present and future consumption. Increases in future consumption can be achieved by a) increasing the domestic capital stock, or b) by investing in foreign assets. Mali’s choice set is, of course, more limited since donors decide partly on the use of resources. Nevertheless, one could argue that to the extent donor-financed projects substitute for government expenditures, Mali could use these funds for investment in foreign assets, which may have a higher yield than investment in domestic capital. However, there is a moral hazard problem. Donors may take increased official foreign assets as a sign for a diminishing need of Mali for foreign concessional money. In this way one could rationally explain Mali’s decision not to accumulate foreign assets.

Concerning the domestic capital stock, it is obvious that investment in the past has not been optimal. Building of new facilities in
face of deteriorating existing ones, due to lack of maintenance, have been common. It appears as if the preference of donors for capital projects over maintenance has been a major factor in this regard. To maximize economic rates of return, donors either have to provide more funds for maintenance, or scale their investment activities in Mali in relation to Mali’s capacity to operate and maintain assets.

On the other side, Mali has one of the highest percentages of salaries in recurrent costs of sub-saharan countries. To spur growth, Mali could redress the balance between personnel and maintenance expenditures in favor of the latter. This, of course, is a decision between present and future consumption, which has to be made by Mali itself.

5.3. Monetary Policy

Next, we turn to the problem of deficits on the operations account. Mali has been, and continues, to use the operations account for systematic balance of payments financing. According to our argument in chapter 3, Mali has no incentive to limit borrowing on this account. Therefore, adjustment will only become necessary when France will press the BCEAO for tighter credit policies to limit Mali’s overdrafts. Two points need to be emphasized.

First, in the present situation, where a large part of total credit is used for deficit financing of public enterprises, and with BDM insolvent, tighter credit policies will quickly lead to a liquidity and solvency crisis of major enterprises. In such a case, third party effects would lead to widespread bankruptcy in the economy, which would not be limited to insolvent enterprises. BCEAO’s stricter policies since December 1986 have already given a first impression of the damage tight control of credit can do. On the other hand, Mali will have no incentive to reform the public enterprise sector if there is no pressure from the monetary side. Thus, we argue, there is a complementarity between public enterprise reform and monetary policy. Realization of some kind of public enterprise reform, including a recapitalization as proposed in the Bank’s public enterprise reform project, will be necessary to have tighter credit policies. However, public enterprise reform will only be undertaken if monetary policy is tightened. It seems as if a simultaneous approach to public enterprise reform and monetary policy is needed, which in turn calls for close coordination between the Bank, the IMF, the BCEAO, and France.

Second, our empirical analysis has shown that the main impact of credit policy is on the net foreign assets position. The offset coefficient below one indicates, though, that it influences domestic activity, too. This is the more true since Mali’s reentry into UMOA in 1984, because under present BCEAO rules individual banks are subject to strict limitations on their total assets. They still can borrow from abroad, but cannot pass on these funds to domestic borrowers. In such a situation, credit policy becomes a powerful instrument of aggregate demand control.\footnote{Such a policy leads to allocational inefficiencies when limits are calculated by applying growth rates to existing assets, as is done in Mali, by suspending competition between banks.}
formal sector, where wages are less flexible, is small; wages appear to be flexible in the informal sector, e.g., in trading or transport. However, Mali fixes nominal prices for a considerable range of "strategic goods", and for output by state enterprises. For equilibrium, one can fix either prices, or credit, but not both. For given credit expansion, there is only one price level which is consistent with equilibrium between aggregate demand and aggregate supply. Mali has to take this into account if adjustment to tighter credit policies should become necessary.8/

To what extent could stricter monetary policies be supplemented by expenditure switching measures, that is by a discretionary rise in the relative price of tradables? This depends on the reaction of real wages. If real wages in the non-tradables sector fall, then a) aggregate demand and imports would decrease, and b) the income differential between the tradables and non-tradables sectors would widen in favor of the former, and thus draw resources into the production of import-substitution goods and exports. There are two difficulties with such a policy. First, given an import ratio of 40 percent, containing wages in the non-tradables sector may be difficult, especially in the civil service. Second, Mali may not want to raise producer prices by the full amount of the effective devaluation, given the present difficulties of the cotton and rice subsectors. In effect, an increase in the relative price of tradables is likely to be used to lower the real wages in these sectors, and would thus diminish the resource allocation effect.

A trade-cum-subsidy scheme would hardly be workable in Mali. Already now 30 to 40 percent of trade bypasses official channels, and the customs administration is not efficient. The major change in resource allocation such a scheme would produce is the likely increase in rent seeking activities. In addition, import tariffs are already high; reform on this side should concentrate on unification of tariff rates. On the export side, subsidies would provide windfall gains for exporters, but would hardly draw additional resources into export production. The reason is simple. Investment decisions depend on expectations, and not on mechanical price changes. If the subsidy would be perceived of as a permanent feature, then it would have an impact. An export subsidy is, however, more likely to be seen as a temporary feature, which will be abolished with the first budgetary difficulties; Mali's Government would not be able to make a credible commitment. The difficulties involved in administering an export subsidy credibly are illustrated by the Ivorian case.

Benefits of membership in the West African Monetary Union outweigh costs for Mali. Therefore, devaluation would only be a sensible option for Mali in the context of a devaluation of the CFA Franc vis-a-vis the French Franc. An assessment of the relative benefits and costs for the Zone as a whole of such an action is beyond the scope of this paper.

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8/ Note the asymmetry between expansionary and restrictive credit policies. The former leads to declining reserves through private capital outflows or higher imports. Restrictive credit policies, coupled with control of banks' asset side, increases reserves solely by restricting imports (no change in interest rates assumed).
5.4. Implications for Bank Strategy

This section presents the conclusions of the paper's analysis as they are relevant to the Bank's macroeconomic strategy.

1. Immediate action is required on the debt side. The transfer nature of past borrowings should be recognized by the donors. Even with fiscal efforts Mali will not be able to pay debt service/revenue ratios of 30 percent. The Bank could be instrumental in obtaining debt relief for Mali. Such a package should aim at a debt service/revenue ratio of below 10 percent, in line with historical relationships.

2. Total new borrowing by Mali should be roughly compatible with the balanced growth rule. Debt service payments should not grow faster than revenues. This requires a) projections of future debt service b) coordination among donors. In both areas the Bank can play an important role. It also requires a decision of either decreasing the size of inflows or of providing more money in grant form.

3. Both from a growth and from an adjustment perspective, public enterprise reform including recapitalization, and especially of BDM, seems to be the most important project for Mali at present. Reform projects need simultaneous coordination with credit policies to succeed. To implement the public enterprise reform project, therefore, close collaboration with France, the Fund, and the BCEAO is necessary.

4. Mali's major problems seem to be on the microeconomic side, including import quotas, price fixing, monopolistic practices by state enterprises, and a wide variance of effective tax rates. If France would be unwilling to refinance the IMF's loans to Mali, the Bank may be in a position to make a structural adjustment operation. Such an operation should be undertaken if major improvements in rules for resource allocation can be obtained - even if it is true that Mali's macroeconomic problems are rather small. A detailed analysis of the microeconomic reforms needed is beyond the scope of this paper.

5. Without adjustment operations the Bank should continue to improve resource allocation through individual projects, subject to the lending rule stated above.
APPENDIX A

Sustainability Model

The aim is to identify a sustainable borrowing path over the longer term. Borrowings are unsustainable if they lead to a debt service/revenue ratio which is growing without limits. We define borrowings to be sustainable if the debt service/revenue ratio remains constant, that is:

\[ DS_t = \gamma R_t. \]  

Additional borrowing \( D_0 \) is undertaken in \( t=0 \), and serviced to maturity \( T \). There is a grace period \( T_G \). Amortization starts after the grace period. Debt service in any period is defined as a fraction of \( D_0 \):

\[ DS_t = \delta(t)D_0. \]

During the grace period, only interest has to be paid on the debt, that is \( \delta(t)=i \) for \( t<T_G \). After the grace period debt service encompasses amortization payments and gradually declining interest payments:

\[ \delta(t) = \left\{ \frac{1}{(T-T_G)} + i \cdot \frac{1}{(T-T_G)} \right\}, \quad t>T_G. \]

We take government revenues as a constant fraction of GDP:

\[ R_t = \alpha Y_t, \]

and express additional borrowing in \( t=0 \) as a fraction of GDP in that year:

\[ D_0 = \beta Y_0. \]

Substituting (2) and (4) into (1), we obtain the required rate of return on additional borrowing for the debt service/revenue ratio to remain constant:

\[ \frac{\Delta Y_t}{D_0} = \frac{\delta(t)}{\alpha \gamma}. \]

Using (5), we can express (6) in terms of required additional GDP growth:

\[ \frac{\Delta Y_t}{Y_0} = \frac{\beta \delta(t)}{\alpha \gamma}. \]

(6) and (7) can be expressed in annual terms, as is done in the text.

This simple model has two advantages. First, the parameters incorporated can be estimated by using easily available data. Second, the exogenous parameters used (revenue/GDP ratio, debt service ratio, size of borrowing, terms of borrowing) can be varied to analyze different scenarios. For example, one may want to explore the debt service implication of a project with a rate of return of 10 percent under the assumption of different "cost recovery" ratios. This is easily done with this model.
APPENDIX B

Estimation of the Offset Coefficient

In this appendix we estimate the offset coefficient empirically. The equation estimated here is derived from analytical work of KOURI and PORTER [1974] and DORNBUSCH [1980]. The analytical model is as follows:

1. \( B^d = B^d(i, i^*, GDP, W) + B^{d*}(i, i^*, GDP^*, W^*) \)
2. \( M^d = L(i, i^*, GDP) \)
3. \( B^s = B^d \)
4. \( M^s = M^d \)
5. \( M^s = NFA + DC \)

The first equation states that domestic and foreign demand for domestic bonds is a function of interest rates, income and wealth. The second equation is a standard money demand function. Equations (3) and (4) are equilibrium conditions for the bond (note that \( B^s \) is the supply to the private sector) and money market. (5) is the banking system's consolidated balance sheet: money supply equals net foreign assets (NFA) and domestic credit (DC). By substituting, calculating total differentials, and rearranging, we obtain the estimating equation:

\[
\Delta NFA_t = \beta_1 \Delta DC_t + \beta_2 \Delta GDP_t + \beta_3 \Delta i^*_t + \epsilon_t,
\]

with \( \epsilon_t \) being a normally distributed error term with mean zero and finite variance. Basically, this equation says that capital movements are determined by the difference between domestic supply of and demand for money. \( \beta_1 \) is the offset coefficient we are interested in. If \( \beta_1 \) is minus one, monetary policy has no influence over real variables; if \( \beta_1 \) is zero, monetary policy is as powerful as in a closed economy. The equation was estimated by OLS (sample 1969-86). The coefficients are:

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<th>Coefficient</th>
<th>Standard Error</th>
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<td>.08</td>
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<tr>
<td>( \Delta GDP )</td>
<td>.03</td>
<td>.04</td>
</tr>
<tr>
<td>( \Delta i^*_t )</td>
<td>-.18</td>
<td>.86</td>
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\( R^2 = .79 \quad SER = 5.8 \quad DW = 1.9 \quad F = 28.2 \)

a Significant at the 1 percent level.
The coefficients imply that money demand factors were not a decisive factor in the determination of the change in net foreign assets during the period under review. The offset coefficient is estimated as -.62, and is significantly different from one.

APPENDIX C

The Influence of Capital Inflows on the REER

In this appendix we examine if changes in Mali’s real exchange rate were caused by its rapidly increasing foreign borrowing. The econometric work is based on the analytical approach suggested by GHANEM and KCHARAS [1986]. There, the real exchange rate is a function of capital inflows, income, the terms of trade and the nominal exchange rate. Our estimating equation is:

\[
\Delta \text{REER}_t = \beta_1 \Delta \text{RMLTC}_t + \beta_2 \Delta \text{GDP}_t + \beta_3 \Delta \text{TOT}_t + \beta_4 \Delta \text{ANEER}_t + \epsilon_t
\]

A rise in real per capita debt (RMLTC) is expected to lead to a real appreciation due to expenditure effects. RMLTC is measured by DOD in the Bank’s debt data base, deflated by the US consumer price index. Changes in GDP proxy for demand pressures not due to capital inflows; increasing GDP is expected to cause a real appreciation. The same is true for the income effects associated with terms-of-trade rises. Finally, the nominal effective exchange rate is included to control for bilateral exchange rate changes. \(\epsilon_t\) is a serially uncorrelated error term with mean zero and finite variance. \(\text{REER}_2\) is used as the independent variable. It is the best proxy for the relative price between tradables and non-tradables, because the WPI is in the numerator and the CPI in the denominator. The equation (sample 1969-86) was estimated by OLS. Results are presented below.

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<th>Independent Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
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<td>(\Delta \text{RMLTC})</td>
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<td>.02</td>
</tr>
<tr>
<td>(\Delta \text{GDP})</td>
<td>-.28(^a)</td>
<td>.11</td>
</tr>
<tr>
<td>(\Delta \text{TOT})</td>
<td>-.04</td>
<td>.11</td>
</tr>
<tr>
<td>(\Delta \text{ANEER})</td>
<td>2.92(^b)</td>
<td>.71</td>
</tr>
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</table>

R\(^2\)=.64  SER=3.9  DW=2.0  F=8.2

\(^a\) Significant at the 5 percent level.
\(^b\) Significant at the 1 percent level.

The coefficients of \(\Delta \text{GDP}\) and \(\Delta \text{ANEER}\) have the expected sign and are statistically different from zero. The coefficient of \(\Delta \text{ANEER}\) is above one.
This indicates that this variable picks up something that is not accounted for in our specification. It may be partly explained by the negative correlation of ANEER with the change in domestic inflation, and its positive correlation with foreign inflation. In both cases the absolute value of the correlation coefficient is .3. The regression coefficient of ATOT shows the expected sign, but is not statistically different from zero.

Our main interest is the influence of capital inflows on the real exchange rate. The regression implies that these inflows do not have an impact on the real exchange rate, since $\beta_1$ is not statistically different from zero. Sensitivity analysis was made with respect to different measures of capital inflows. While Mali has almost not commercial debt, more than half of capital inflows in any year are in the form of grants. The reported result seems to be robust with respect to different measures.

**APPENDIX D**

The Impact of Resource Inflows on Imports

The fact that resource inflows do not seem to affect Mali's real exchange rate suggests the hypothesis that most of these inflows finance additional imports. In this appendix we test this hypothesis empirically. Our model of import determination explains the level of imports by a) resource inflows; b) terms of trade; c) GDP; d) lagged imports; and e) trend. According to our hypothesis additional inflows should be spent mainly on additional imports. Rising terms of trade would lead to higher imports due to income effects. Rising GDP is supposed to lead to rising imports for the same reason. Lagged imports are included to account for stickiness in import volume due to adaptation costs. The trend is included because some variables are highly correlated because of trend growth. Not including a time trend would show high explanatory power of variables which may vanish once a trend term is included. The estimated equation is:

$$ IM_t = \beta_0 + \beta_1 \text{TREND} + \beta_2 IM_{t-1} + \beta_3 \text{GDP}_t + \beta_4 \text{INFLOW}_t + \beta_5 \text{TOT}_t + \epsilon_t. $$

OLS estimation of this equation would be biased and inconsistent due to simultaneous equation bias. The reason is that imports and income are simultaneously determined; the same is true for imports and official transfers (e.g., food aid). Therefore, we used the two stage least squares procedure (2SLS). Instruments used for GDP are investment and exports, and instruments for INFLOW are lagged inflows and changes in DOD from the Bank's data base. The results are:
The model fits the data well; also, individual parameters are estimated with precision. The estimation supports our hypothesis that most resource inflows are used for additional imports. 90 percent of additional inflows are estimated to be used for imports. The only surprising result is that GDP growth has no explanatory power for imports. This can be explained as follows. The GDP variable should pick up deviations from trend growth, which is accounted for by the trend variable. These deviations occur mainly during droughts. To avoid simultaneous equations bias, however, we had to use instruments which unfortunately eliminate this effect. Thus, the insignificance of GDP is less surprising than it might seem at first sight.
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Background information and data were provided by IMF REDs. Additional data sources are the Mali country program division's data base, IFS, and World Bank debt data base.