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WP/89/61

INTERNATIONAL MONETARY FUND

Fiscal Affairs Department

Financial and Fiscal Programming Under Debt Rescheduling

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August 1, 1989

Abstract

This paper reviews implications for financial and fiscal programming of different treatments of external debt rescheduling. Adjustment formulas are derived to ensure invariance of the macro-economic outcome. An important consideration is the impact on the income position of the central bank. The results caution against the simple adjustment formulas sometimes applied. Even when defined on a "falling due basis," the size of the public sector deficit can be affected by the rescheduling treatment adopted. Under a properly defined aggregation between public sector deficit and income position of the central bank, the rescheduling treatment affects only the composition of the broader deficit.

JEL Classification Numbers
3110, 3210, 3220

* The author wishes to acknowledge helpful comments received from Vito Tanzi, Peter Heller, David Goldsbrough, Walter Mahler, and Peter Stella. This paper was prepared when Peter Heller was in charge of the Government Expenditure Analysis Division.

<u>Contents</u>	<u>Page</u>
I. Introduction	1
II. A Formal Presentation	6
III. Implications for Financial Programming	12
IV. Implications for Fiscal Programming	16
V. Variations and Operational Issues	18

Summary

In recent years, the majority of Fund-supported adjustment programs have included debt rescheduling or restructuring arrangements as part of their financing package. The specific treatment of such arrangements has potentially important implications not only for the balance of payments but also for public sector operations. Generally, the Fund's preferred practice has been to treat rescheduling arrangements purely as general balance of payments support, a preference that has led to the recommendation that the public entities concerned should continue to make payments in domestic currency according to scheduled maturities. When the public sector directly benefits from the rescheduling of external obligations, its cash operations and deficit are significantly affected. The difference is not necessarily reconciled by departing for analytical purposes from the "cash basis" of fiscal operations and adding "above the line" the shortfall between scheduled interest obligations and the payments actually made.

This paper reviews the implications for financial programming in general, and fiscal programming in particular, of two "polar" cases exemplifying how the rescheduling of external debt obligations is, or is not, passed on to the public sector. Adjustment formulas are derived to ensure invariance of the macroeconomic outcome. An important consideration is the impact of the rescheduling treatment on the income position of the central bank. The results caution against simple adjustment formulas and identify cases where such formulas could lead to slippages from the macroeconomic objectives of the program. They suggest that if the public sector and the central bank compete to minimize their contribution to an overall consolidated deficit that would include the central bank, there are conditions under which the public sector is likely to seek having the rescheduling passed on to itself. This would be the case if relevant domestic interest rates are higher than the external interest rates in the period of rescheduling, and if they are expected to be higher than the ones predicted by the interest rates arbitraging formula in periods following the rescheduling. Even when defined on a "falling due basis," the size of the public sector deficit can be affected by the rescheduling treatment adopted.

One interesting implication of the analysis is that by establishing a performance criterion on the sum of net claims on the public sector and "other items net" of the central bank, the performance of the fiscal and financial program could be better ensured and monitored.

I. Introduction

In recent years, the majority of Fund-supported adjustment programs have included, as part of their financing package, debt rescheduling or restructuring arrangements with regard to government, government guaranteed, and (in some instances) private external debt obligations. The specific treatment of such arrangements has potentially important implications not only for the balance of payments but also for public sector operations, and in particular for the assessment and monitoring of the fiscal adjustment under the program.

Generally, the Fund's preferred practice has been to treat rescheduling arrangements purely as general balance of payments support--a preference that has led to the recommendation that the public entities concerned should continue to make payments in domestic currency (generally to the central bank) for external obligations according to the scheduled maturities, even if these payments are not subsequently externalized.

There appear to be three main reasons for this preference: (1) it allows continuity in the basis for comparison of the fiscal performance over the years; (2) it facilitates macroeconomic management, in particular the control of expenditure policies, by not allowing a loosening of the liquidity position of public entities concerned; and (3) it implies neutrality (and hence likely greater efficiency) regarding the way the additional foreign savings obtained through rescheduling, ostensibly for general balance of payments support, would be allocated within the economy.

Clearly, though, the recommended practice is not without its own drawbacks. For instance, in the case of ex ante program targets for domestic credit to the public sector, the practice may require continued and sometimes difficult monitoring of payments made in domestic currency to prevent credit targets being met through nonpayment of the domestic counterpart of external debt obligations. In the case of rapid depreciation of the exchange rate in the period following the rescheduling, the practice is likely to put severe pressure on the income position of the central bank, as the latter would absorb the foreign exchange losses. While it could be argued that appropriate exchange rate management is the responsibility of the central bank, it is nevertheless the case that public sector entities (such as public enterprises involved in import intensive activities) may have long benefited from an overvalued exchange rate.

When the public sector (defined here exclusive of the central bank) directly benefits from the rescheduling of external obligations (interest and principal), its cash operations are significantly affected; hence, (1) actual cash interest will be reduced by both the amount of external interest rescheduled and the possible saving on domestic interest resulting from the lesser need to recourse to domestic bank or nonbank financing; (2) on the other hand, actual cash interest

payments would increase by the amount of external moratorium interest payments that have to be made by the public sector (rather than the central bank) on the rescheduling; and (3) as indicated above, the nonpayment of principal amounts falling due also provides, on the financing side, additional liquidity to the public sector entities, which can be used either to reduce other sources of domestic financing or to finance additional outlays. Even without the latter taking place, the cash deficit of the public sector would clearly differ from the case where external payments in domestic currency are made according to their original maturities. The difference is not necessarily reconciled by departing for analytical purposes from the "cash basis" of fiscal operations and adding, "above the line," the shortfall between scheduled interest obligations and the payments actually made.

The purpose of this paper is to review in a systematic manner the implications for financial programming in general, and fiscal programming in particular, of the two "polar" cases outlined above regarding ways the rescheduling of external debt obligations are, or are not, passed on to the public sector. The viewpoint taken is that the macro-economic objectives of the program are (or ought to be) invariant to whichever treatment of rescheduling is adopted. Accordingly, the paper derives adjustment formulas, in particular for net claims of the central bank on the public sector (often a performance criterion), to ensure that such an invariance applies. 1/

It is essential to have full ex ante agreement on, and ex post adherence to, whichever rescheduling treatment is adopted. This, more than anything else, including a priori preference for a particular treatment, will minimize the risks of slippages from program projections, notwithstanding genuine concerns about the allocative efficiency of domestic and foreign savings in the case where rescheduling is passed on to the public sector. An important consideration is the impact of the rescheduling treatment on the income position of the central bank; hence, a key assumption will be that the profits (or losses) of the central bank are not automatically transferred to (or covered by) the government budget. Such an assumption clearly applies in the case of losses, which are generally covered by a reduction in

1/ Which rescheduling treatment to adopt is not always a matter of choice for the authorities. For the Banque Centrale des États de l'Afrique de l'Ouest (BCEAO), which is the Central Bank for the Union Monétaire Ouest Africaine (UMOA), regulatory constraints on domestic bank financing of the government deficit has pretty much necessitated the pass through of the rescheduling to the public sector, given the size of fiscal deficits prevailing.

central bank reserves; but manipulation in the share of profits going to the treasury versus the accumulation of central bank reserves is also a possibility. ^{1/}

Section II presents the formal analytical model. Sections III and IV discuss the implications of the model for financial programming and fiscal programming, respectively. Section V concludes by addressing some operational issues and indicating possible variations to the two polar cases reviewed in the paper, particularly, as they apply to the debt of public enterprises. Given the technical nature of the paper, the rest of this section provides a summary of the principal results, which caution against the simple adjustment formulas that are sometimes applied in the context of Fund programs.

Specifically, the results confirm that if the interest rate charged by the central bank in the period of rescheduling is equal to the external interest rate on rescheduling, the same macroeconomic outcome will be attained whether the rescheduling is not (Case I), or is (Case II), passed on to the public sector, provided that in the latter case the target for net bank claims on the public sector is adjusted downward by the amount of the rescheduling in local currency terms. This simple adjustment, aimed at offsetting the liquidity effect of the rescheduling passed on to the public sector, will however need to be tightened (loosened) when the interest rate charged by the central bank is higher (lower) than the external interest rate on rescheduling to ensure attainment of the same macroeconomic objectives in the rescheduling period under Case II as under Case I. This would reflect the need to offset (accommodate) the negative (positive) impact that the rescheduling treatment under Case II has on the net income position of the central bank, and hence its expansionary (contractionary) effect on base money.

When the interest rate charged by the central bank is higher than the external interest rate on rescheduling, that negative impact would result from the fact that while under Case II the government has to meet the interest cost on the rescheduling, it is cheaper for the government to do so than to borrow from the central bank to make the local currency deposits in payment of original external debt service obligations. But the other side of the coin is, of course, that a loss of net income results for the central bank, in comparison with Case I.

Furthermore, the adjustment required under Case II to reflect different domestic and foreign interest rates will be amplified in periods following the rescheduling period even if no additional factors are at work. Hence, for instance, when the domestic interest rate

^{1/} See David S. Robinson and Peter Stella, "Amalgamating Central Bank and Fiscal Deficits" in Measurement of Fiscal Impact: Methodological Issues, Occasional Paper No. 59 (Washington: International Monetary Fund, 1988).

charged by the central bank on net claims on the public sector is higher than the foreign interest on the rescheduling, treatment of the rescheduling under Case II will have a persisting negative effect on the net income position of the central bank. The lower level of other liabilities net at the end of the rescheduling period will reduce the earnings capacity of the central bank in the following period, and hence its other liabilities net at the end of that period, which has to be offset by a lower level of net claims on the public sector to reach the original macroeconomic objectives.

New factors will be at work in periods following the rescheduling period, if the interest rate charged by the central bank in these periods is higher (lower) than the one implied by the so-called interest arbitrating formula. In particular, if it is higher, the net claims of the central bank on the public sector will also need to be tightened in these subsequent periods under Case II, in comparison with Case I. To put it differently, as long as the exchange rate loss that may need to be assumed by the public sector does not offset the interest rate differential against domestic borrowing, treatment of the rescheduling under Case II is shown to be favorable to the public sector (unfavorable to the central bank). Again, the necessary tightening of targets on net claims on the public sector under Case II reflects the need to offset the liquidity expansion associated with a deterioration in the net income position of the central bank.

The above discussion suggests that if the public sector and the central bank compete to minimize their contribution to an overall consolidated deficit that would include the central bank, the public sector is likely to press for the rescheduling treatment under Case II, if relevant domestic interest rates are higher than the external interest rates in the period of rescheduling and are expected to be higher than the ones predicted by the interest rates arbitrating formula in periods following the rescheduling; otherwise, the public sector pressure is likely to be for treatment as under Case I. The above situation is likely to prevail in an environment where (1) inflation is a problem, (2) the interest rate charged by the central bank is broadly market determined, and (3) there is both a binding external financing constraint and an exchange rate policy that is expected to be inflexible.

If the interest inequalities indicated above prevail, and yet the simple adjustment formula referred to earlier is implemented under Case II, the macroeconomic objectives of the program will not be met; in particular, there will be an underperformance of the balance of payments. Clearly this is because the incomplete adjustment under Case II will provide additional resources to the public sector at the same time as it produces a level of net domestic assets which is inconsistent with attainment of the original net foreign asset target. Ignoring the obvious, although in practice often relevant, case where the public sector would use its additional resources to support higher primary

expenditures, the focus is on the situation where the public sector utilizes these additional resources in the rescheduling period to reduce its net borrowing from the domestic bond market.

Mirroring the relatively greater reliance on monetary rather than bond financing of the primary fiscal deficit, the level of net domestic assets would then rise above the appropriate target (even if the higher level of net claims on the public sector would also tend to imply a lesser deterioration of the central bank's net income position, and hence higher end-of-period level of other liabilities net).

The above situation would coincide with the emergence of an excess demand on the domestic bond market; the resulting downward pressure on the domestic bond rate is, indeed, how the expansionary macroeconomic impact would be effected. The central bank can offset the above development by issuing additional securities of its own. Provided these securities are perfect substitutes for government bonds, and the central bank and bond market rates are the same, it can exactly duplicate the case where full adjustment of net claims on the public sector applies, with the same impact on the net income position of the central bank.

As indicated earlier, even if the public sector deficit is defined on a falling due basis rather than a pure cash basis under Case II (i.e., both scheduled external interest payments and interest payments on the rescheduling are included above the line), and the necessary adjustment formulas are fully applied when the public sector benefits from the rescheduling, the deficit level can be affected by the rescheduling treatment adopted.

Specifically, it will be lower in the rescheduling period under Case II if the domestic interest rate charged by the central bank is higher than the external interest on the rescheduling. This outcome would also tend to make the deficit under Case II lower in the period following the rescheduling; the tendency would be reinforced (offset) if the domestic interest rate is then also higher (lower) than the one implied by the interest arbitrage formula. As expected, aggregation between the public sector deficit and the central bank's net income position makes the aggregate fiscal deficit invariant to the rescheduling treatment, with the latter only affecting the distribution of the deficit. But under Case II even this result necessitates a careful specification of the government deficit at the time of repayment on the rescheduling--one that requires amortization on the rescheduling to be valued at the original exchange rate. Otherwise, a realized exchange rate loss could be hidden below the line in financing of the public sector under Case II, while it would be fully reflected above the line as an expenditure in the central bank's net income position under Case I.

One interesting implication of the analysis is that by establishing a performance criterion on the sum of net claims on the public sector and other items net of the central bank (which is a subset of net

domestic assets of the central bank), one would be better able to ensure and monitor performance of the fiscal and financial program itself. To the extent that not only the net income position of the central bank but also the amounts in the blocked deposits with respect to rescheduling were to be included in other items net, there would be no need for any adjustment in such a performance criterion, whatever the treatment of rescheduling turned out to be. Of course, the distribution between net claims on the public sector and other items net of the central bank would be affected.

II. A Formal Presentation

First, the two polar cases for treatment of the rescheduling will be defined more precisely as follows:

Case I: The treasury provides the central bank with the domestic counterpart of external debt obligations, as if there were no rescheduling. The central bank does not externalize the debt payments, and freezes the treasury's payments in a blocked account. While on the one hand, no interest is earned on the blocked account, on the other hand, the central bank assumes the servicing of rescheduled debt obligations, including interest payments on the rescheduling. Reflecting the fact that the treasury considers its debt servicing obligations as met, proceeds in the blocked account are not part of net credit to government. 1/ The blocked account is drawn down when the repayments on the rescheduling are falling due; any insufficiency due to exchange rate variations is reflected in the central bank's net income position. The latter also absorbs the interest payments on the rescheduling.

Case II: The treasury does not provide the central bank with the domestic counterpart of external debt payments, and in this narrow sense only benefits from the rescheduling (which is not meant to allow an expansion of the primary deficit). The central bank remains essentially uninvolved, and the treasury fully assumes the debt servicing of rescheduled obligations, including the interest payments on the rescheduling. In this case, the treasury also bears the exchange rate risk.

Next, the starting point of the financial programming exercise consists of taking as given a set of macroeconomic relationships and targets that includes the specification of private sector behavior, the primary fiscal deficit (i.e., the deficit exclusive of interest expenditure), and capital inflows (including those associated with debt rescheduling). To reach any specified level of net foreign assets, the

1/ Purely for convenience, the word "government" will be used from now on; but it should be interpreted in the broadest sense to include, possibly, the government corporations (but excluding the central bank).

central bank will need to target its net domestic asset (NDA) to the level that equates the supply and demand for base money--that is, the level derived from

$$e(t) \text{ NFA}^* + \text{NDA} = \frac{u() + v}{1 + u()} M^d() + \text{Rev} \quad (1)$$

where

NFA^* = end-of-period net foreign assets target (in foreign currency)

NDA = end-of-period net domestic assets

$u()$ = deposit/currency ratio

v = reserve ratio

$M^d()$ = end-of-period money demand

Rev = end-of-period revaluation account

$e(t)$ = end-of-period exchange rate.

The ratio $u()$ will generally be a decreasing function of the interest rate, r_a , on bank deposits. On the other hand, the demand for broad money $M^d()$ would depend positively on r_a , but negatively on the bond market rate of interest, r , and would also be an increasing function of the nominal disposable income, Y_d . 1/ The variables Y_d , r_a , and r can be viewed as determined on the markets for domestic goods, bank deposits/credit, 2/ and bonds, respectively, with the equality between the target base money supply and base money demand implied by expression (1), ensuring that the balance of payments objective will be met, presumably through adjustment of the exchange rate.

A breakdown of the central bank's NDA that should prove useful in most cases is as follows:

$$\text{NDA} = A + \text{NC}_g - \text{OLN} - \text{BD}_g - \text{CBB} \quad (2)$$

1/ One would, furthermore, expect the demand for base money

$\frac{u() + v}{1 + u()} M^d()$ to be negatively related to the deposit rate r_a .

2/ One can conceive of a fixed margin between the banks' deposit rate, r_a and lending rate, r_l ; hence, under perfect competition, $r_a = r_l(1-v)$ is likely to hold.

where

A = advances to deposit money banks

NC_g = net claims on the government

OLN = other liabilities net, including the central bank's cumulated net income position.

BD_g = "blocked" deposits of the government

CBB = the central bank's liabilities to (or claims on, if negative) the nongovernment sector, through its participation in the bond market.

Clearly, some of the above variables directly affect the macroeconomic outcome. Since the latter is assumed to be determined independently from the way the rescheduling of the government's external obligations is treated domestically, the following variables will be viewed as exogenously determined: (1) the level of advances to the deposit money banks, A, which would affect the supply of bank credit to the nongovernment sector, and hence the banks' lending and deposit rates; and (2) the level of central bank liabilities to the nongovernment sector, which would affect the bond market and hence the interest rate on bonds, r.

The central bank's net claims on the government at the end of period t, NC_g(t) (which could possibly be negative) are derived before rescheduling as a residual from the government budget constraint 1/

$$NC_g(t) = NC_g(t-1) + PBD(t) + \bar{e}(t) i^*(t) + i(t) + i_c(t) - [b(t) - p(t)] - \bar{e}(t) [b^*(t) - p^*(t)] \quad (3)$$

where

PBD(t) = the primary government deficit, defined exclusive of interest payments

$\bar{e}(t)$ = average exchange rate in period t

$i^*(t)$ = external interest due before rescheduling

$i(t)$ = domestic interest on government bonds

$i_c(t)$ = interest on net claims of the central bank

1/ The time scripts t-1 and t are introduced; period t runs from time t-1 to time t.

$b(t), p(t)$ = government domestic borrowing and amortization on the bond market

$b^*(t), p^*(t)$ = government foreign borrowing and amortization before rescheduling.

Again, a number of variables must be treated as exogenously determined; they are the primary government deficit, $PBD(t)$; the net domestic financing through the bond market, $[b(t) - p(t)]$; and the gross foreign borrowing, $b^*(t)$. Otherwise, the target macroeconomic outcome would generally be affected. Nevertheless, different arrangements regarding the way the external rescheduling is treated in the fiscal accounts could affect the budget constraint (3) and hence the variable $NC_g(t)$. They could also alter the size of the government's deficit--that is, a measure of the government's contribution to the external current account imbalance; the latter would remain invariant to the particular domestic treatment of the rescheduling. 1/

To illustrate the issues that are involved, a two-period (t and $t+1$) application of the framework described above will be considered. Specifically, it will be assumed that the external debt obligations falling due during period t , $i^*(t) + p^*(t) \equiv RS^*(t)$ are entirely rescheduled in the form of a one-year loan maturing during period $t+1$. Interest rates on the rescheduling are presumed to be $r_s^*(t) RS^*(t)/2$ in period t and $r_s^*(t+1) RS^*(t)/2$ in period $t+1$, during which $RS^*(t)$ is repaid; $r_s^*(t)$ and $r_s^*(t+1)$ are foreign interest rates in period t and $t+1$, respectively, as they apply to the rescheduling. Furthermore, the government is assumed to pay (earn) domestic interest on its net borrowing from (lending to) the central bank amounting to

$$i_c(t) = r_c(t) NC_g(t-1) + r_c(t) [NC_g(t) - NC_g(t-1)] / 2 \quad \underline{2/}$$

Given the presumption that the macroeconomic objectives are set independently of the rescheduling treatment, it follows from the above discussion that only the variables NC_g , BD_g , and OLN could differ when the rescheduling is treated according to Case I or II. The possibility that the government's and/or the central bank's policy regarding their participation on the bond market varies according to Cases I and II, and whether these variations could be neutral on the macroeconomic outcome,

1/ The general balance of payments practice is to include, above the external current account line, the external interest falling due, as well as those accruing on the rescheduling.

2/ The above formulations implicitly assume that the flow of external and domestic debt obligations are evenly distributed over the period.

will be discussed later. Accordingly, net claims on the government at the end of period t can be derived for Case I, using expression (3) and other specifications, to find 1/

$$NC_g(t) = \frac{1}{1 - \frac{r_c(t)}{2}} \left[\left(1 + \frac{r_c(t)}{2}\right) NC_g(t-1) + PBD(t) + i(t) + \bar{e}(t) i^*(t) + \bar{e}(t) (p^*(t) - b^*(t)) \right] \quad (4.1)$$

The other liabilities net of the central bank, including its cumulated net income position, are then given by 2/

$$OLN(t) = OLN(t-1) + r_c(t) NC_g(t-1) + r_c(t) \left(\frac{NC_g(t) - NC_g(t-1)}{2} \right) - \bar{e}(t) r_s^*(t) \frac{RS^*(t)}{2} - i'(t) \quad (4.2)$$

where $i'(t)$ is the interest paid by the central bank on its borrowing on the bond market. The end-of-period level of blocked deposits will, of course, be

$$BD_g(t) = \bar{e}(t) RS^*(t) \quad (4.3)$$

End of period, $t+1$, levels of NC_g , OLN , and BD_g under Case I will similarly be given by

$$NC_g(t+1) = \frac{1}{1 - \frac{r_c(t+1)}{2}} \left[\left(1 + \frac{r_c(t+1)}{2}\right) NC_g(t) + PDB(t+1) + i(t+1) + \bar{e}(t+1) i^*(t+1) + \bar{e}(t+1) (p^*(t+1) - b^*(t+1)) \right] \quad (5.1)$$

1/ Because the government's interest obligations to the central bank in the current period depend in part on the new borrowing from the central bank in the period, there is a need to solve the government budget constraint for $NC_g(t)$. Note that when $r_c(t) \geq 2$, there are no meaningful solutions; $NC_g(t)$ cannot be treated as a residual since any increase in credit would imply such levels of additional interest payments that the deficit and financing needs would continue to grow indefinitely. Furthermore, purely for simplicity of exposition, the target net domestic borrowing on the bond market is from now on implicitly assumed to be zero.

2/ From now on, the net foreign assets target is also implicitly assumed to be zero, as is the interest rate on the central bank advances.

$$\begin{aligned}
 \text{OLN}(t+1) &= \text{OLN}(t) + r_c(t+1) \text{NC}_g(t) \\
 &+ r_c(t+1) \left(\frac{\text{NC}_g(t+1) - \text{NC}_g(t)}{2} \right) - \bar{e}(t+1) r_s^*(t+1) \frac{\text{RS}^*(t)}{2} \quad (5.2) \\
 &- (\bar{e}(t+1) - \bar{e}(t)) \text{RS}^*(t) - i'(t+1)
 \end{aligned}$$

$$\text{BD}_g(t+1) = 0 \quad (5.3)$$

Turning to Case II, the derivations are similar to those above, but take into account the impact of the rescheduling of external obligations on the government's budget constraint (3). For end-of-period t , they yield

$$\begin{aligned}
 \tilde{\text{NC}}_g(t) &= \frac{1}{r_c(t) - \frac{1}{2}} \left[\left(1 + \frac{r_c(t)}{2} \right) \text{NC}_g(t-1) + \text{PBD}(t) + i(t) \right. \\
 &\quad \left. + \bar{e}(t) r_s^*(t) \frac{\text{RS}^*(t)}{2} - \bar{e}(t) b^*(t) \right] \quad (6.1)
 \end{aligned}$$

$$\tilde{\text{OLN}}(t) = \text{OLN}(t-1) + r_c(t) \text{NC}_g(t-1) \quad (6.2)$$

$$+ r_c(t) \left(\frac{\tilde{\text{NC}}_g(t) - \text{NC}_g(t-1)}{2} \right) - i'(t)$$

$$\tilde{\text{BD}}_g(t) = 0 \quad (6.3)$$

and for end-of-period $t+1$

$$\begin{aligned}
 \tilde{\text{NC}}_g(t+1) &= \frac{1}{r_c(t+1) - \frac{1}{2}} \left[\left(1 + \frac{r_c(t+1)}{2} \right) \tilde{\text{NC}}_g(t) + \text{PBD}(t+1) + i(t+1) + \bar{e}(t+1) i^*(t+1) \right. \\
 &\quad \left. + \bar{e}(t+1) (p^*(t+1) - b^*(t+1)) + \bar{e}(t+1) r_s^*(t+1) \frac{\text{RS}^*(t)}{2} + \bar{e}(t+1) \text{RS}^*(t) \right] \quad (7.1)
 \end{aligned}$$

$$\begin{aligned}
 \tilde{\text{OLN}}(t+1) &= \tilde{\text{OLN}}(t) + r_c(t+1) \tilde{\text{NC}}_g(t) \\
 &+ r_c(t+1) \left(\frac{\tilde{\text{NC}}_g(t+1) - \tilde{\text{NC}}_g(t)}{2} \right) - i'(t+1) \quad (7.2)
 \end{aligned}$$

$$\tilde{\text{BD}}_g(t+1) = 0 \quad (7.3)$$

Comparison between expressions (4.1) and (6.1), (4.2) and (6.2), and (4.3) and (6.3) yields for end-of-period t

$$\tilde{NC}_g(t) = (NC_g(t) - BD_g(t)) - K \bar{e}(t) RS^*(t) \quad (8.1)$$

$$O\tilde{LN}(t) = OLN(t) - K \bar{e}(t) RS^*(t) \quad (8.2)$$

where

$$K = \left[\frac{\frac{r_c(t)}{2} - \frac{r_s^*(t)}{2}}{1 - \frac{r_c(t)}{2}} \right]$$

and $BD_g(t) = \bar{e}(t) RS^*(t)$.

Similar comparisons can be made for end-of-period $t+1$; however, it is first necessary to derive "reduced form" expressions for (5.1)-(5.2) and (7.1)-(7.2). Such reduced forms can be obtained by replacing $NC_g(t)$ and $OLN(t)$ in (5.1)-(5.2) by their expressions from (4.1)-(4.2), and $\tilde{NC}_g(t)$ and $O\tilde{LN}(t)$ in (7.1)-(7.2) by their expressions from (6.1)-(6.2).⁸ After some mathematical manipulations, comparison between the resulting reduced forms yields

$$\tilde{NC}_g(t+1) = NC_g(t+1) - V \bar{e}(t) RS^*(t) \quad (9.1)$$

$$O\tilde{LN}(t+1) = OLN(t+1) - V \bar{e}(t) RS^*(t) \quad (9.2)$$

where

$$V = \left[\frac{\frac{1 - r_s^*(t)/2}{1 - r_c(t)/2} \left(1 + \frac{r_c(t+1)}{2}\right) - \left(1 + \frac{r_s^*(t+1)}{2}\right) \frac{\bar{e}(t+1)}{\bar{e}(t)}}{r_c(t+1) \left(1 - \frac{r_c(t+1)}{2}\right)} \right]$$

Note also that $\tilde{BD}_g(t+1) = BD_g(t+1) = 0$.

III. Implications for Financial Programming

A number of useful implications for multi-period financial programming can be drawn from the above results. In particular, the results indicate how performance criteria on net claims to the government must be adjusted to reflect the rescheduling treatment, specifically:

1. Provided that the interest rate on the rescheduling is the same as the one charged by the central bank for its net claims on government, the adjustment required in the rescheduling period, t , to the target for net claims on government, $NC_g(t)$, when the local currency

counterparts are not deposited with the central bank, is to reduce the target by the amount of rescheduling in local currency terms (cf. expression (8.1)). This is the simple adjustment formula referred to earlier.

In this special case, the net income position of the central bank is not affected by the treatment of rescheduling, and hence neither are its other liabilities net at the end of the period (cf. expression (8.2)). Expression (8.1) shows, however, that if the interest rate on the central bank's net claims on government is higher than the one on rescheduling, which is likely in an inflationary domestic environment when central bank interest rates are, in addition, market related, a further downward adjustment in net claims on government is necessary in period t , if the same macroeconomic objectives are to be met under Case II as under Case I.

This would essentially reflect the need to offset the negative impact that the rescheduling treatment under Case II has, under the above circumstances, on the net income position of the central bank, and hence its end-of-period other liabilities net. This negative impact reflects the fact that while under Case II the government has to meet the interest cost on the rescheduling, it turns out to be cheaper for the government to do so than to borrow from the central bank to make the local currency deposits in payment of original external debt service obligations. But the other side of the coin is, of course, that a loss of net income results for the central bank, in comparison with Case I.

Evidently, the above argument would apply in reverse for the case where the interest rate on the central bank's net claims on government is lower than the one on rescheduling. Then the government would lose (the central bank gains) from treating the rescheduling as under Case II. Thus, the downward adjustment required in the target for net claims on government under Case II, in comparison with Case I, would be by less than the amount of the rescheduling valued in local currency terms. This last statement does not, of course, address the question of the adequacy of the interest rate charged by the central bank on its net claims on the government.

If the adjustment to the central bank's net claims on government is less than the full amount required in the case where the relevant domestic interest rate is higher than the one on the rescheduling, additional resources become available to the government to provide either increases in noninterest expenditures or reductions in nonbank domestic financing. Whichever the course taken, it would have macroeconomic implications. Specifically, there would be a rise in domestic demand resulting, in the first instance, from a money-financed increase in the primary budget deficit, and, in the second instance, from the liquidity effect associated with the greater reliance on monetary rather than bond financing of the primary government deficit. In both cases, without other offsetting actions, the expansion of net domestic assets would not be consistent with attainment of the initial net foreign assets target. (See below for a further expansion on this.)

2. The adjustment to NC_g that is required under Case II will become larger in the periods following the one where the rescheduling applies, even if no additional factors are at work. This is best illustrated by assuming the special case where:

$$1 + \frac{r_c(t+1)}{2} = \left(1 + \frac{r_s^*(t+1)}{2} \right) \frac{\bar{e}(t+1)}{\bar{e}(t)}$$

(see below for an interpretation). Then the expression V in (9.1) and (9.2) would reduce to:

$$\left\{ \frac{\frac{r_c(t)}{2} - \frac{r_s^*(t)}{2}}{1 - \frac{r_c(t)}{2}} \right\} \frac{1 + \frac{r_c(t+1)}{2}}{1 - \frac{r_c(t+1)}{2}} \quad (10)$$

which is greater than K in expression (8.1) if $r_c(t) > r_s^*(t)$, and implies a further downward adjustment in net claims on government (and other liabilities net) in period t+1, in addition to the adjustment required in period t.

The reason for this outcome is that treating the rescheduling under Case II in period t--when the domestic interest rate charged by the central bank for net claims on government is higher than the foreign interest rate on the rescheduling--has a persisting negative effect on the net income position, and hence end-of-period other liabilities net of the central bank. The lower level of other liabilities net reflects a permanent reduction of the central bank's capital base. Thus, it reduces the earnings capacity of the central bank in period t+1, and hence its other liabilities net at the end of that period, which has to be offset by a lower level of NC_g to reach the original macroeconomic objectives.

3. The extent to which the targets for net claims on the government (and other liabilities net of the central bank) have to be adjusted in the periods following the rescheduling, for example, period t+1 (also the repayment period), to account for the impact of new factors can best be analyzed by assuming the special case $r_c(t) = r_s^*(t)$. Then the expression V in (9.1) and (9.2) would reduce to

$$\left\{ \frac{\left(1 + \frac{r_c(t+1)}{2} \right) - \left(1 + \frac{r_s^*(t+1)}{2} \right) \frac{\bar{e}(t+1)}{\bar{e}(t)}}{1 - \frac{r_c(t+1)}{2}} \right\} \quad (11)$$

which will be positive, if the domestic interest rate on net claims on government is higher than the one implied by the so-called interest

arbitraging formula. Hence the target for NC_g at end-of-period $t+1$ would then also need to be adjusted downward when the rescheduling of period t is treated under Case II, essentially to offset the negative impact that such a treatment has, again under the above circumstances, on the net income position of the central bank. Even if $r_c(t) = r_g^*(t)$, the government would still eventually gain from assuming the interest charges and repayment obligations attached to the rescheduling of the previous period, rather than borrowing from the central bank in period t to make the original payment in local currency terms into a blocked account.

Not surprisingly, the above argument now depends not only on the differential between the rates $r_c(t+1)$ and $r_g^*(t+1)$ but also on the exchange rate movement between period t and $t+1$. Expression (11) is most likely to be positive when domestic interest rates are high and the exchange rate is not depreciating. However, if there were a substantial devaluation of the exchange rate in $t+1$ not fully reflected in the interest rate differential, expression (11) could become negative, in which case the central bank would actually benefit from the treatment of the rescheduling according to Case II relative to Case I. This is essentially because Case II shifts the exchange rate risk to the government. An upward adjustment in net claims on government for end-of-period $t+1$ would then be warranted without jeopardy to the overall macroeconomic objectives.

As indicated in the earlier discussion, an incomplete downward adjustment in the target for net claims on government when Case II applies, and the relevant domestic interest rate is higher than the foreign interest rate on the rescheduling (taking into account the appropriate adjustment for exchange rate variations in the period following the rescheduling), provides additional resources to the government. It would also result in a level of net domestic assets that is inconsistent with attainment of the original net foreign assets target. This issue can now be further explored, looking also at offsetting policies that the central bank would need to undertake to reach the balance of payments objective. Throughout the following discussion, the assumption will be that the government uses its additional resources to reduce its net borrowing on the domestic bond market.

We focus our attention on the situation where the adjustment under Case II consists of the familiar formula setting $\tilde{NC}_g(t) = NC_g(t) - BD_g(t)$ where $BD_g(t) = \bar{e}(t) RS^*(t)$; as shown by (8.1), it is an insufficient adjustment when $r_c(t) > r_g^*(t)$. It would tend to increase the level of NDA above the appropriate target, even if the higher $NC_g(t)$ would also imply a lesser deterioration of the central bank's net income position, and hence higher end-of-period level of other liabilities net. This follows from the fact that in comparison with $\tilde{NC}_g(t)$, the level of $NC_g(t)$ will be higher by $K \bar{e}(t) RS^*(t)$ (cf. expression (8.1)), while $OLN(t)$ will be higher by only $r_c(t) K \bar{e}(t) RS^*(t) / 2$ (cf. expression (6.2)). Hence the level of NDA as provided by expression (2) will overshoot its target.

Clearly, the central bank can offset the above development with regard to NDA by issuing additional bonds of its own, dCBB. Assuming that the latter are perfect substitutes for government securities on the bond market, the amount and value of additional bonds issued could coincide with $dCBB = K \bar{e}(t) RS^*(t)$. But this would result in an exact duplication of the case of full adjustment to $\tilde{NC}_g(t)$, including the level of end-of-period NDA, only if (cf. expression (6.2)) $di'(t) = r_c(t) K \bar{e}(t) RS^*(t) / 2$. This requires that the bond market rate, r , equals the central bank rate, $r_c(t)$. Otherwise, one should expect whatever offsetting policy undertaken by the central bank to affect the macroeconomic outcome. Note that if $r = r_c(t)$, the net income position of the central bank, and hence end-of-period other liabilities net, would be as given by expression (8.2) under Case II.

IV. Implications for Fiscal Programming

We now look at the implications of treating the rescheduling under Cases I and II for the fiscal deficit target. Again, we start with the assumption that there is no consolidation between the government deficit and the central bank's net income position. The simplest approach is to look at the government's deficit defined from the financing side; hence, for period t , the latter coincides with

$$[NC_g(t) - NC_g(t-1)] + \bar{e}(t) [b^*(t) - p^*(t)] \quad (12.1)$$

under Case I, and

$$[\tilde{NC}_g(t) - NC_g(t-1)] + \bar{e}(t) [b^*(t) + RS^*(t) - p^*(t)] \quad (12.2)$$

under Case II. (Recall that, purely for simplicity of exposition, the target net domestic borrowing on the bond market is assumed to be zero.)

Implicitly, expression (12.2) also assumes that the external debt obligations--including above the line--are treated on a falling due basis rather than a purely cash basis, with the entire amount of rescheduling shown as additional gross inflow. The government deficit of period $t+1$ is defined by

$$[NC_g(t+1) - NC_g(t)] + \bar{e}(t+1) [b^*(t+1) - p^*(t+1)] \quad (13.1)$$

under Case I, and

$$[\tilde{NC}_g(t+1) - \tilde{NC}_g(t)] + \bar{e}(t+1) [b^*(t+1) - p^*(t+1)] - \bar{e}(t) RS^*(t) \quad (13.2)$$

under Case II.

Regarding expression (13.2), the perhaps unusual practice of valuing the amortization of previous rescheduling at the previous period's exchange rate must be noted. This specification is necessary to have a fully consistent specification of the consolidated public sector deficit under both rescheduling treatments. Of course, the government budget constraint necessitates the recording of the offsetting foreign exchange loss (gain) above the line as an exceptional expenditure or revenue item. Using $NC_g(t)$, $\tilde{NC}_g(t)$, $NC_g(t+1)$, $\tilde{NC}_g(t+1)$, as provided by expressions (4.1), (8.1)^g, (5.1)^g, and (9.1)^g, respectively, the reduced form expression summarized as

$$Z(t) \quad (14.1)$$

under Case I, and

$$Z(t) - K \bar{e}(t) RS^*(t) \quad (14.2)$$

under Case II can be derived. For period $t+1$, reduced form expressions summarized as

$$Z(t+1) \quad (15.1)$$

under Case I, and

$$Z(t+1) - [V - K] \bar{e}(t) RS^*(t) \quad (15.2)$$

under Case II can also be derived. Furthermore, using expressions (4.2), (8.2), (5.2), and (9.2), the following relationships hold

$$[OLN - OLN(t-1)] = [OLN(t) - OLN(t-1)] - K \bar{e}(t) RS^*(t) \quad (16.1)$$

$$[OLN(t+1) - OLN(t)] = [OLN(t+1) - OLN(t)] - [V - K] \bar{e}(t) RS^*(t) \quad (16.2)$$

which allows a comparison of the central bank's net income position in period t and $t+1$ when the rescheduling is treated as under Case II instead of Case I.

Interpretation of expressions (14.2), (15.2), (16.1), and (16.2) is straightforward: even if the government deficit is defined on the falling due basis indicated above, and the financial programming is fully adjusted to be consistent with the same macroeconomic objectives, the level of the government's deficit may not be invariant to the way the rescheduling is treated. Specifically, treatment under Case II will tend, in comparison with Case I, to lead to a lower (higher) deficit in period t if K is positive (negative), and a lower (higher) deficit in period $t+1$ if $V-K$ is positive (negative). This means that the deficit will be lower in the rescheduling period under Case II if the domestic interest charged by the central bank is higher than the external interest on the rescheduling. This outcome would also tend to make the

deficit under Case II lower in the period following the rescheduling; ^{1/} the tendency would be reinforced (offset) if the domestic interest rate is then also higher (lower) than the one implied by the interest arbitraging formula. Of course, as illustrated by expressions (16.1) and (16.2), the above differences will be matched by a lower (higher) net income position of the central bank. If the latter were fully added to the government's deficit, the consolidated public sector deficit would indeed be invariant to the treatment of the rescheduling.

Again, it should be noted that defining the government deficit, from the financing side, as in expressions (13.1) and (13.2), is essential for obtaining the above full equivalence. In particular, if the current rather than initial exchange rate is used to value the amortization on the rescheduling in $t+1$, the consolidated public sector deficit would be understated under Case II, in comparison with Case I. This is because the exchange rate loss would then have been hidden below the line under Case II, as negative financing, whereas under Case I it would be fully reflected as an expenditure in the central bank's net income position.

V. Variations and Operational Issues

Needless to say, the analytical example worked out in the previous sections of this paper is only meant to be a useful caricature of real life situations. Actual rescheduling packages are often more complex, both with regard to the time frame covered, treatment of unpaid interest prior to rescheduling agreements, and so on, and to the way the external and domestic terms of the rescheduling are defined. While consideration of most of these refinements would not significantly alter the conclusions of the paper, attention should be drawn to a number of operational issues and possible variations to the polar cases discussed above, particularly with respect to the rescheduling of external debt obligations of public enterprises.

While the analysis of this paper has focused on the government deficit and the net income position of the central bank, it applies as well to the case where the government deficit is broadened to include the deficit of public enterprises--that is, the public sector deficit (excluding the central bank). Consolidation of financial operations "above the line" and on the financing side implies that the external interest and amortization payments due before rescheduling would be the sum of obligations from the government and public enterprises; for the latter, the obligations could be on the external debt contracted with or without the guarantee of the government.

^{1/} Recall that expression V is positive and greater than K when $r_c(t) > r_s^*(t)$.

The net lending operations of the government to the public enterprises, and the associated interest receipts and expenditures, disappear from the consolidated financial operations; but the above financial flows may include flows related to the onlending by government of foreign loans. The manner in which the rescheduling of obligations on the original foreign loans contracted by the government impact (or not) on the onlending flows may affect the distribution of the consolidated deficit between the government and public enterprises, but not the deficit itself or the consolidated operations. 1/ 2/

While experience has shown that for government or government-guaranteed debt, the external terms of the rescheduling arrangements tend to be quite separate from their domestic terms (reflecting, presumably, the fact that whether the obligor is the government itself or the central bank is of no direct importance for the foreign creditor as long as the country is guarantor of the arrangements), this is not necessarily the case when dealing with the debt of enterprises, and in particular the nongovernment-guaranteed debt of public enterprises (and, a fortiori, of private enterprises). 3/ Focusing on the nongovernment-guaranteed debt of public enterprises, rescheduling arrangements (presumably on bank debt) could still closely follow the polar Cases I and II. Under Case I, upon receipt by the central bank of payments in domestic currency of external obligations according to the original schedule (and at the prevailing exchange rate), the external obligations would be rescheduled on the same terms as those applying to the government or government-guaranteed debt. Under Case II, without payments in blocked accounts, the nonguaranteed debt of public enterprises could generally be rescheduled only to the extent that specific arrangements with the foreign creditors are made (on terms that may differ from those applying to government or government-guaranteed debt). Note that the terms of the external rescheduling may not always be independent of the domestic payment arrangements, as was implicitly assumed in the example worked out in the previous sections.

Combinations of Cases I and II result, for instance, when the domestic counterpart deposits in blocked accounts at the central bank can be made on a delayed basis, following a revised schedule (generally within the time frame applying to the rescheduling of government and government-guaranteed debt) and the exchange rates that apply to these payments are not the ones prevailing at the time of deposits, but earlier (and presumably less depreciated) ones, such as those prevailing

1/ When the government benefits from the rescheduling, in the sense that Case II applies, it may decide to pass on some of the terms of the rescheduling to its onlending operations to the public enterprises.

2/ These could, however, be affected in the case of onlending operations to enterprises outside the public sector.

3/ Treatment of the rescheduling of private debt will not impinge on the public sector deficit (excluding the central bank), but would generally impact on the net income position of the central bank.

when the scheme itself is introduced. Since the central bank pays interest to the foreign creditors from the outset of the implementation of the scheme, and then services the officially rescheduled obligations when the domestic counterpart deposits are made, it generally charges both fees for the forward cover provided and interest for the delayed provision of domestic counterpart deposits. While this implies that for the period following the rescheduling, the arrangements eventually follow Case I, in the meantime, they borrow features from both Cases I and II. Hence, the delayed provision of domestic counterpart deposits means that the enterprise benefits from the rescheduling (as under Case II); yet, in return for payments of domestic interest and fees, they are shielded from the external servicing of the rescheduling, including the foreign exchange risk (as under Case I).