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Is Debt Relief in the Interests of the Creditors? \*

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Abstract

This paper considers a number of reasons--in addition to the "incentives" argument--why debt relief could be to the advantage of creditors collectively. Principal reasons analyzed are based on the "investment-capacity" and the "default-forestalling" arguments. Debt relief is defined as reduction of the present value of the contractual debt. The paper thus provides an analytical basis for various debt relief proposals that do not require finance or guarantees from creditor governments and for the considerable amount of relief in the form of rescheduling and concerted lending that has already taken place. The free rider problem and the extent to which the market may overcome it is discussed.

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Summary

The paper reviews the arguments on whether debt relief benefits creditors collectively. Debt relief is defined as a change in the contractual stream of payments agreed to by the creditors which also benefits the debtor. It includes not just reduction of interest or principal but also rescheduling, restructuring, and concerted lending. Hence, this paper is an attempt to explain the actual rather than the hypothetical impact of relief.

The paper starts with a general argument against debt relief, namely the "ceiling" argument based on the fact that repayment capacity is uncertain: reducing contractual debt reduces the ceiling of possible payments and, if capacity to pay turns out to be higher, creditors would lose.

Some arguments in favor of relief that might qualify the ceiling argument are then discussed. The first is the "incentives" argument already expounded in an earlier paper: adjustment effort or investment designed to raise capacity to pay might increase as a result of relief since a high contractual debt in relation to capacity to pay is like a 100 percent tax on effort or investment. The second argument in favor of debt relief is the "investment-capacity" proposition: debt relief increases the debtor country's capacity to invest and the higher investment will raise capacity to pay in the future, with some of the rewards going to the creditors.

Third, there is the "debt-forestalling" argument: sufficient relief may discourage default, and repayments after relief may be greater than if there had been partial default. This argument hinges on the likelihood that default penalties would be avoided with relief. The provision of relief well ahead of the time when default might take place can be motivated by a desire to reduce endogenous uncertainty resulting from prospective bargaining, or to reduce negotiating costs.

Finally, the free rider problem is discussed: debt relief may be in the collective interest of creditors but may nevertheless not take place to the optimal extent. It can be overcome through collective action of banks in negotiating committees, through enforcement threat or persuasion by governments, and possibly through a market solution.



## Is Debt Relief in the Interests of the Creditors?

### I. Introduction

Some proposals for relief of commercial debt of developing countries involve the provision of funds or guarantees by third parties--usually the governments of industrial countries or multilateral institutions underwritten by these governments. The common proposal for an international debt facility (analyzed in Corden, 1988a) is of this kind as are proposals for buybacks of debt financed by third parties, like the Bolivian buyback. The purpose of this paper is to analyze various possible reasons why debt relief without funds or guarantees from third parties could be in the interests of creditors collectively. One of the reasons--based on the incentives argument--was expounded in Corden (1988b) and here several others (beginning in Section V) are added.

Because of the free rider problem, the required degree of relief may not be in the interests of particular banks acting individually, but would be in their collective interest. Hence, some degree of organization may be necessary as in the process of "concerted lending" and negotiations by bank committees. While this whole category of proposals falls under the heading of "market-based approaches" to the debt problem, it is a common view that the market is unlikely to bring about the necessary results owing to the free rider problem. But it will be suggested in the fuller discussion at the end of this paper that there are market forces that might deal with the problem.

An important point to be stressed is that the concept of debt relief should be broadly defined and, if it is, there has actually been a great deal of relief. This paper is thus an attempt to explain what has happened and not just what might happen. Finally, the paper is not concerned with the interests of debtors or the world system. There could obviously be circumstances where debt relief is not in the direct interests of creditors, but nevertheless would be desirable because of the interests of debtors or some broader world interest. These considerations fall outside the scope of this paper. 1/

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1/ There is an extensive theoretical literature on which this paper builds. The paper has been influenced principally by Eaton, Gersovitz, and Stiglitz (1986), Sachs (1988), Sachs and Huizinga (1987), Krugman (1985), Krugman (1988a), and Dooley (1987). Other relevant recent papers include Krugman (1988b) and Helpman (1988a).

## II. What is Meant by Debt Relief?

The concept of debt relief needs to be interpreted broadly. It is a change in the contractual stream of payments agreed to by the creditors which is favorable to the debtor. Initially, there is a stream of interest and amortization payments which the country is obliged to pay. If the payments are reduced for any period and not increased for any other, there is clearly debt relief. Whatever the discount rate, the present value of the contractual debt is reduced. Debt relief might take the form of reduction of contractual interest payments or of reduction of principal. In the latter case, it is usually described as "debt forgiveness," whether partial or whole. 1/

Debt relief must be distinguished from a reduction of the resource transfer by the debtor--i.e., reduction of the actual payments made. If the creditors believe that it is in their collective interest to provide debt relief, they must believe that the resource transfer will eventually be increased as a result. It is the purpose of this paper to explore this possibility: In what circumstances might reduction of the contractual value of the debt actually increase resource transfers?

Debt forgiveness is uncommon as is reduction of interest rates. (A change in the interest rate should be thought of here as a change in the margin above LIBOR, bearing in mind that LIBOR--essentially the world market rate--varies for reasons exogenous to the debtor-creditor relationship discussed here.) What has been common has been rescheduling of amortization payments and provision of new loans under "concerted lending" programs to finance debt service. In these cases, contractual payments to be made are lowered in an early period and raised in later periods. This is also true of interest capitalization. They are all equivalent to new loans being made in an early period to pay debt service, hence adding to repayment obligations later. The concept of debt relief

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1/ When a country buys back its own debt in the market at a discount and this is financed by loans obtained at the same (or a similar) rate of interest as is charged on the original debt, for example, through a concerted lending program, the contractual value of the country's indebtedness is reduced, so that the effect is essentially the same as a reduction of principal. For example, a new loan of \$60 million might be obtained which the debtor uses to buy back debt with a contractual value of \$100 million (the discount being 40 percent); the country's contractual indebtedness would then be reduced from \$100 million to \$60 million. If the new loans are provided by the original creditors, the loans contain an element of relief because they do not incorporate the risk element in the interest rate which the market requires when the debt sells at a discount. If the new loans were provided by a third party, for example, a multi-lateral institution, the net effect would be similar to that of a debt facility, the relief not being provided by the original creditors but by the third party.

is then not so obvious. The answer has to be that if the present value of the contractual debt using the discount rate of the debtor is reduced as a result, there is then debt relief. The change is favorable to the debtor.

In that sense, there has been a great deal of debt relief since the debt crisis emerged and this paper is an attempt to explain what has happened and not just what might happen. It is concerned as much with the rationale of rescheduling, restructuring, and concerted lending as with bringing out the underlying assumptions of debt relief proposals.

The crucial issue is to define the appropriate discount rate of the debtor. It should be equal to the debtor's own marginal rate of time preference and marginal product of capital, and, if these two are not equal, to some weighted average of the two, depending on how additional funds would be utilized. If the domestic interest rate were not controlled, the discount rate would simply be equal to the domestic (real) rate of interest. Let the interest rate charged on the new (or rescheduled) loans be  $r$ . This has often been higher than the interest rate originally charged, and might involve a significant margin above LIBOR. But suppose that the discount rate of the debtor is  $q$ , and that  $q$  is greater than  $r$ . The present value of the contractual debt to the debtor is then reduced and there has been debt relief.

One might ask why  $q$  could exceed  $r$ , when  $r$  is equal to or above the world market rate. Why cannot the debtor borrow on the world market in the normal way at rate  $r$  until the domestic rate is brought down to  $r$ -- i.e., until  $q = r$ ? The answer is that--as discussed in Dooley (1987) and elsewhere--the market has some expectation of default or forced (endogenous) debt relief and, to compensate for that, wants an interest rate higher than  $r$ , possibly as high as  $q$ , to compensate for the perceived risk. If new or rescheduled loans are provided at rate  $r$  they are, in fact, being provided at a below-market--i.e., a subsidized--rate.

### III. Method of Approach

To simplify, it will now be assumed that there are only four periods. In period 1 the debt is incurred, period 2 is the present period at the beginning of which decisions are being made by the debtor and by creditors and when a new set of expectations about the next period are being formed. In period 3, debt service--both interest and repayment of principal--falls due, and finally, there is a later period 4 which will hardly enter into the discussion here but when the debtor country may wish to borrow again and for the sake of which it might wish to maintain reputation. The possibility will also be allowed for that some debt service has to be paid in period 2, and also that period 3 consists really of more than one year, with separate payments, and possibly separate bargains in different years.

The method of approach here is first to present a very simple model in which there is no case for debt relief from the point of view of the creditors. This is based on the "ceiling" argument. The crucial element

is uncertainty. Then a number of separate "arguments for debt relief" are presented which qualify the conclusions from the simple model.

The various arguments for debt relief hinge on a variety of assumptions and no attempt is made to present a single model where they could all apply at the same time, though in fact they can be combined in various ways. The practical relevance of any particular argument is an empirical matter--often a matter of guesswork about the future, about the marginal productivity of investment, and so on--and this is not pursued here. But it has to be stressed that the simple argument against relief could sometimes outweigh all the qualifying arguments.

First, one should note the simplest case where there is complete certainty about the extent of repayment. A debt is inherited from period 1 which requires a total repayment (interest and principal) of \$100 million in period 3. Repayment depends purely on "capacity to pay"--i.e., the ability to generate the necessary resource transfer (non-interest current account surplus), which is equal to the real value of gross domestic product (allowing for terms of trade) less some well-defined minimum level of domestic consumption and gross investment. The latter may be needed, say, to keep capital intact for period 4. In this simple case, there is no separate "willingness to pay." If the country has the capacity to pay, it will pay up to the limit of capacity. Furthermore, suppose that in period 2 the perception is that capacity to pay in period 3 is certain to be, say, \$60 million. The debt will then have a 40 percent discount in the market. Default (or debt relief to avoid default) can be firmly predicted.

The contractual debt could be reduced in advance to \$60 million, or it could be reduced in period 3 itself, but whatever is done would make no difference. Debt relief that would take place in period 3 can be described as "endogenous" relief since it is really inevitable and would yield results no different from default.

"Capacity to pay" is, of course, not in practice such a precise figure as implied here. For example, concepts of minimum consumption levels can change over time. Furthermore, in the case of sovereign debt the relevant concept is the capacity to pay by the government, which depends on its ability to tax and to adjust expenditures. It will be assumed here that developments that raise national capacity to pay through increased investment or improved terms of trade, for example, raise the total taxes that can be levied, and thus the government's capacity to pay.

#### IV. Uncertainty, the Ceiling, and the Incentives Effect

Uncertainty can now be introduced. This yields a general argument against debt relief, most fully developed in Krugman (1988a). 1/

There is a probability distribution of expected capacity to pay. The expectations are in period 2 about what might happen in period 3. The "ceiling" to expected payments is set by the contractual value, while the floor to expected capacity to pay, and hence to actual payments, is zero. The debt is again valued at a discount in period 2 since there is some expectation that capacity to pay will be below the ceiling. If it actually turns out to be so, there will again have to be default or endogenous debt relief.

This time, debt relief in period 2--i.e., in advance--would have an adverse consequence for the creditors and would actually reduce the present value of the expected repayments. The simple point is that it would reduce the ceiling without raising the floor. If capacity to pay turned out to be above the new ceiling, some repayments would have been lost. The creditors would lose the chance of benefiting from very favorable capacity to pay outcomes, however unlikely these may be. This is the "ceiling effect" of debt relief. It follows that, given the assumptions of this model, there is no case for "exogenous" debt relief in period 2--i.e., in advance of the time for repayments--even though "endogenous" debt relief may be very probable in period 3.

We come now to the various arguments for debt relief. The first one is the incentives argument put in Sachs (1988), Sachs and Huizinga (1987), and Krugman (1988a). It has been expounded and analyzed in Corden (1988b) and hence is not presented in detail here. 2/

Very roughly, the idea is that debt relief might increase investment or "adjustment effort" in period 2, hence raising capacity to pay in period 3. With a high contractual debt, any increases in capacity to pay would benefit only the creditors (like a 100 percent marginal tax rate imposed by the creditors) until the full value of the contractual payments has been met--i.e., until endogenous relief or default has been avoided. There is thus a disincentive to increasing investment or making the adjustment effort in period 2. On the other hand, if the contractual debt were reduced, the debtor might find it easier to meet the full value of the (reduced) required payments, and increases in capacity to pay beyond a certain level would benefit the debtor country itself. The marginal tax rate would then be zero. The country would thus have an incentive to make

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1/ See also Krugman (1985) and Eaton, Gersovitz, and Stiglitz (1986); the concept of the "ceiling" comes from Corden (1988a).

2/ Krugman (1988a) combines in a formal model (where there are two possible states of the world, a good one and a bad one) the uncertainty model above and the incentives argument.

sacrifices (by reducing consumption) in period 2 to raise capacity to pay in period 3. The creditors could thus find that, if they reduced the contractual payments in period 2, they would end up getting more in period 3. 1/

#### V. Raising Capacity to Pay with Extra Investment

A second argument for debt relief may be called the investment-capacity argument. The idea is that debt relief would give the debtor country more capacity to invest, and this investment would then strengthen capacity to pay in the future and so increase the probability of eventual repayment of the debt. In this case, relief takes the form of rescheduling, concerted lending, or interest capitalization. 2/

The assumptions of this argument need to be carefully specified. In the incentives argument, the aim was to increase investment now (period 2)--and hence capacity to pay later (period 3)--at the cost of reduced consumption now. In the investment-capacity argument, the aim is to increase investment now at the cost of reduced resource transfers abroad now for the sake of increased capacity to pay later. In both cases, eventual repayment is assumed to be determined by capacity to pay, not willingness to pay, though the latter can be introduced.

The investment-capacity argument is subject to some qualifications which presumably limit its relevance. It can be expounded in a very simple model. There are the usual four periods with the relevant story going on in periods 2 and 3. This time, unlike the previous case, there is some contractual debt service obligation (interest plus amortization) not only in period 3 but also in period 2. Let these be R2 and R3. In period 2, the country has capacity to pay at least R2, given that it forgoes a lot of domestic investment and we can assume that, in the

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1/ This argument assumes that increased adjustment effort involves less consumption and more savings in period 2, and that these savings are then invested in the country, thus raising its period 3 capacity to pay. But if capital were mobile, the higher savings might be invested abroad, and whether this increases capacity to pay depends on whether the fruits of foreign investment can be taxed. Once capital mobility is allowed for, a distinction must be made between savings and investment. In the realistic case where capital mobility is imperfect, the simple argument that higher savings lead, to some extent, to higher investment at home, and so to higher capacity to pay, can stand.

2/ Exactly the same qualification applies here as in the previous footnote. Debt relief gives the country more resources to invest at home or abroad and this is likely to increase capacity to pay in period 3, but less so when there is capital mobility. When the relief is provided for sovereign debt, it is probable that the extra resources would be used, at least to some extent, for public investment at home. On the other hand, if debt relief leads to lower taxes than otherwise, private agents might choose to invest some of their additional resources abroad.

absence of debt relief, it would make the contractual payment  $R_2$ . At the same time, expected capacity to pay in period 3 is  $zR_3$  (where  $z < 1$ ) so that some endogenous debt relief or default is expected in that period and the value of the debt is thus at a discount.

It will now be assumed that period 2 payments are rescheduled at interest rate  $r$  (which might be LIBOR plus some small margin). Alternatively, interest payments due might be capitalized while amortization payments are rescheduled, also with an interest rate  $r$  being applied. It all comes to the same thing, being equivalent to new money being provided to pay  $R_2$ , and  $r$  being charged for the new money. The interest rate  $r$  is at least equal to the opportunity cost of the funds to the creditors. The result is that the contractual payments due in period 3 rise from  $R_3$  to  $R_3 + R_2(1 + r)$ .

The crucial assumptions are now made that (a) the debtor country would use the saved resources for investment and (b) the investment would be sufficiently productive that it could more than pay for itself. Let us assume that  $q$  is the average product of the new investment. In period 3 the extra investment of period 2 thus adds in present value terms  $R_2(1 + q)$  to the national product, and hence to capacity to pay. (Since the additional capital stock would still be in place in period 4, if the whole of  $R_2(1 + q)$  were to be used for repayments in period 3, there would have to be new borrowing in period 3 on the security of this additional capital stock.) The assumption that the new investment has more than paid for itself means that  $q > r$ .

If the whole of the extra capacity to pay were actually paid to the creditors, they would obtain a gain of  $R_2(q - r)$  relative to what they would have obtained otherwise in period 3. (The payment of  $rR_2$  is not a gain to them since it only represents the opportunity costs to them of these funds.) Of course, there will still have to be endogenous relief or default, in this case equal to  $R_3(1 - z) - R_2(q - r)$ . But the conclusion is that, from the point of view of creditors as a whole, there is a gain. There would even be some gain if the increase in capacity to pay were shared with the debtor rather than all going to the creditors.

A qualification to this argument emerges once uncertainty about capacity to pay is introduced. A risk factor then attaches to the debt. That is a reason why the creditors would not wish to increase their loans to the country, at least if they already hold more than they regard as optimal given their expectations in period 2--which will have changed since the debts were incurred in period 1. Even if there is a mean probability that the investment would be sufficiently productive ( $q > r$ ), this must be weighed against the undesirability of increasing the share of these loans in their portfolios.

Returning to the comparison between the two investment arguments, in the incentives argument debt relief is provided for period 3 repayments but this must be known in period 2, so that investment or adjustment effort in period 2 would increase appropriately. In the investment-

capacity argument, the relief is provided for period 2 and actually reduced transfers out of the debtor country in that period.

These two investment arguments interact. The greater the adjustment incentive--i.e., the more relief is granted for period 3 (up to a limit)--the greater will be the proportion of resource gains obtained by the debtor country from period 2 relief that will be invested rather than consumed and so raise capacity to pay in period 3. The investment-capacity argument refers to an income effect which is likely to raise both consumption and savings (and hence investment), while the incentives argument refers to a substitution effect which brings about--or may bring about--a switch from consumption toward savings (and hence investment).

#### VI. Debt Relief to Forestall Default

It can be shown that there may be a case for debt relief in any particular period to forestall the possibility of default in that same period, the aim being to bring about more repayments--i.e., a higher resource transfer--than otherwise. This simple model should bring out the main short-term motivation underlying the willingness of creditors to reschedule debts. This default-forestalling argument provides a third possible basis for debt relief. The basic idea is that the remaining resource transfer or repayment would be greater with debt relief than when there is default, even though the latter may only be partial. Of course, in neither case would there be full repayment of the contractual debt. 1/

It must now be assumed that capacity to pay in the sense in which the term was used in the previous section is greater than the contractual debt. Hence, repayments could be made. Furthermore, there is no

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1/ The banks may wish to forestall the need to declare the debtor in default not only for the reasons given in the text here--to increase the resource transfer--but also to avoid the costs of default to themselves. This must mean that there are costs of default that are borne by the creditors, whether for regulatory or other reasons. The "endogenous relief" mentioned earlier was motivated by these costs. In the simplest case described in Section III, capacity to pay in period 2 was firmly below the contractual debt so that default or endogenous relief was inevitable. Similarly, in the "incentives" and the "investment capacity" cases, capacity to pay was given in period 3, determined by investment in period 2, and the extent of the resource transfer was given. If the capacity to pay was insufficient for full debt repayment, default or equivalent "endogenous" debt relief was inevitable. If creditors chose the latter, it must be because they saw some advantage over default for them even though there would be no effect on the resource transfer. It follows that there are two possible "default-forestalling" motives, the one given in the text, which depends on the costs of default to the debtor, and an additional one, depending on costs of default to the creditors.

uncertainty about the various variables. The debtor's payments depend on "willingness to pay." <sup>1/</sup>

In Figure 1, the horizontal axis shows the level of debt service paid. At O, nothing is paid and there is thus 100 percent default or debt relief, while at OA there is 100 percent payment of interest and repayment of principal. The vertical axis shows resource gains and losses to the debtor as a proportion of GDP. Moving upwards to the left along BA shows how the debtor gains (relative to 100 percent payment) as the degree of default or relief is increased. OB is thus the real resource transfer (as a proportion of GDP) that is avoided by complete default.

The next step is to introduce the costs of default to the debtor country. These need not be defined precisely here but include the effects of such penalties as the loss of trade credit, losses from trade restrictions imposed on the country, and the loss of reputation which may affect the ability to borrow or trade in period 4. The costs of default are also measured as a proportion of GDP. When there is 100 percent default, these costs are BC so that the net gain to the debtor from full default compared with full payment is OC.

It is an interesting question how the costs of default are likely to vary either with the extent of default or with the extent of repayment. <sup>2/</sup> Various possible assumptions could be made. Here we begin by making the following special assumptions. First, as soon as there is any default at all, there are substantial costs of default to the debtor. Even with a very small repayment shortfall below the 100 percent level of OA, there are significant costs, so that there is a discrete jump in the costs as soon as there is any default. Second, the costs of default rise as the size of the repayment declines. Third, if some relief of the contractual debt is provided but the country still defaults, the costs of default do not decline unless the actual repayment declines. For example, when the initial contractual debt is \$100 million and a repayment of only \$40 million is made (default being \$60 million), the cost of default may be x percent of GDP. If debt relief then reduces the contractual debt to \$50 million but repayments stay at \$40 million (with the default ratio falling from 60 percent to 20 percent), the cost of default remains at x percent.

Hence, one might get a curve such as CDA which shows the net gains to the debtor for various levels of repayment when there is default. The costs of default increase as the extent of repayment declines, so that CD (in the case drawn in Figure 1) reaches its maximum not at C but at E, where repayment is partial. When there is full repayment, the net gain is zero (at OA). When there is a small default, there is a net loss of AD,

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<sup>1/</sup> "Willingness-to-pay" models with penalties are discussed in Eaton, Gersovitz, and Stiglitz (1986), pp. 486-92. See also Bulow and Rogoff (1988).

<sup>2/</sup> The term "repayment" is used to refer to the sum of interest and amortization payments.

being the costs of default with infinitely small gains from a reduced resource transfer. When default goes up to AF (leaving repayment of OF), the gain to the debtor is maximized.

It is assumed here that the creditors neither lose nor gain from default compared with debt relief to the same extent. The losses resulting from reduced gains from trade resulting from default penalties are borne by the debtor and by third parties, but not actually by the creditors--i.e., the banks--themselves. Nor do the banks gain anything from seizure of assets, for example. From the point of view of the two parties, the costs of default represented by the vertical distance between BA and CD are Pareto losses.

In this case, in the absence of debt relief, the debtor country will indeed default to the extent of FA, gaining FE as a result. The resource transfer FA is lost to the creditors. The creditors could avoid this situation by providing debt relief. Minimal relief to the extent of GA would give the debtor country marginally more gains than when it partially defaulted (i.e., GH is marginally greater than FE). The country would avoid the costs of default and (relative to full repayment) would gain GH in resource transfer foregone, while the creditors get repayment of OG rather than OF and hence benefit from such debt relief. Further relief would reduce the gain to the creditors and increase the gain to the debtor.

Hence, the result of minimal debt relief is that the resource transfer to the creditors has increased and yet the debtor is marginally better off. For the two combined, there is a Pareto improvement. The costs of default reflect a Pareto inefficiency and are now avoided.

It is perfectly possible that the perceived or expected costs of default are so high that they outweigh the gains. This would mean in Figure 1 that CD would be below the horizontal axis. Hence, there would be no case for debt relief from the point of view of the creditors.

It is also possible that the costs of default do not rise so sharply when the extent of default increases, in which case the CDA curve would reach its maximum at C: the maximum gain to the debtor in the absence of debt relief would result from 100 percent default. Given that costs of default are incurred, it may thus pay the debtor to go all the way and avoid the resource transfer completely. This would definitely be true in the special case where the costs of default do not rise as repayments decline or default increases, but where there is a fixed default cost incurred as soon as there is any default, however small. (CD would then be parallel to BA.) The choice for the creditors would then be between zero or inadequate debt relief leading to 100 percent default, giving the

debtor OC, and debt relief leading to partial repayment and giving the debtor a gain of little more than OC. 1/

The decision by the debtor whether or not to default will depend not on the actual costs of default (as suggested in the simple exposition here) but on the expected costs. This is worth stressing since there is usually considerable uncertainty about the nature, extent, and effects of the penalties that might be imposed. Furthermore, the relief that will be granted by the creditors will depend, among other things, on their uncertain assessment of the debtor's expectations.

The next step is to introduce the possibility of bargaining. So far, it has been assumed that the debtor country does not bargain with the creditors. Rather, it reacts to the given debt relief policy of the creditors. But there is clearly scope for bargaining. If debt relief went beyond AG, the debtor could gain more. And it would be in the interests of the creditors to go beyond AG if that were necessary to forestall a higher level of default. Hence, the debtor could threaten default and extract more debt relief. The extreme threat of the debtor would be 100 percent default, and if this threat had to be implemented, the debtor would still gain OC (which could be very low), while the creditors would lose all. The extreme threat of the creditors is to give no relief which, if implemented, would lead to partial default by the debtor, yielding the debtor EF and the creditors OF.

The level of relief is thus likely to settle somewhere between AG and AF. The creditors would not offer more than AF, for then they would be worse off than with zero relief, while the debtor country would not accept less than AG, for then it would be worse off than if it defaulted by FA.

If the debtor country were in a strong bargaining position, the creditors might feel compelled to give relief of just under FA which would leave them with receiving a debt repayment only a little larger than when the debtor defaulted (i.e., OF). But the debtor would obtain a large gain of just under EJ--i.e., it would gain through no longer incurring the costs of default while paying just a little extra for a higher resource transfer. In other words, the gains from relief would go mainly to the debtor, with no loss or only a slight gain being incurred by the creditors. This case is worth noting since it brings out the point that debt relief, which is Pareto-optimal for the various reasons discussed in

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1/ The analysis becomes less simple when the costs of default rise with the extent of default rather than with the extent of repayment. Debt relief might then not be able to forestall default since for any level of relief there would be a new level of optimal default. If relief increased, repayments would also decline. This case is not worked out in detail here. The key point is that the larger is the fixed element in the default penalty (i.e., the element that is independent of the size of the default), the more likely is it that some debt relief could forestall default.

this paper, may largely benefit the debtor while not imposing losses on creditors rather than the gains going wholly or mainly to the creditors.

#### VII. Reducing Endogenous Uncertainty and Negotiating Costs

It may well be accepted that the full contractual value of the debt cannot or will not be paid. Is there then not a case for reducing uncertainty and explicitly writing down the value of the debt in advance rather than waiting until the problem arises and a debt relief versus default decision has to be made? This general idea will now be given more precision. It provides the basis for a fourth argument for debt relief. Alternatively, it could be described as a variation of the default-forestalling argument. The argument is that there should or might be debt relief agreed upon in period 2 to reduce uncertainty about what will happen in period 3.

If there were complete certainty in period 2 about the extent of repayment in period 3, there would be no need to formalize the matter in advance. Furthermore, if uncertainty were entirely exogenous, it could not be reduced and there would be an argument against debt relief on grounds of the "ceiling effect" outlined in Section IV. Hence, the aim now must be to reduce endogenous uncertainty.

Such endogenous uncertainty arises because there is scope for bargaining in period 3 on the lines just discussed. In period 2, the parameters may be anticipated; there may be little or no uncertainty about the limits to the deal: debt relief would have to be within the AG-AF range in Figure 1. But it is not known where it would be. In addition, the parties may be uncertain about the extent of default costs. Thus, the range AG-AF could be very wide, and there is also, of course, the possibility of failure to settle, so that default results.

It is to the interests of both parties that they have a clearer idea in period 2 what the outcome of the bargain in period 3 will be. In the presence of risk aversion and the advantages of being able to plan in advance, each party would be prepared to forego some chance of a more favorable outcome for the sake of a firm settlement now. Some degree of debt relief as the outcome of a mutually beneficial bargain is inevitable: the question is at what level it will be set. The case is thus for bargaining in period 2 rather than period 3, and hence for the creditors providing some relief in period 2.

A problem arises if there is not only endogenous but also exogenous uncertainty. If the bargain is to be struck in advance, there should be some contingency clauses to allow for exogenous uncertainty. But some ceiling effect will remain, the costs of which the creditors must set against the benefits from reducing endogenous uncertainty when providing debt relief in advance.

Finally, there is a fifth possible reason for debt relief. This is also a reason for providing relief in advance and might also be viewed as a variation on the default-forestalling argument. The qualifications resulting from exogenous uncertainty also apply in this case. Debt relief in advance of the periods when all the repayments fall due may be designed to reduce negotiating costs. Let us now assume that period 2 is followed by periods 3, 4, 5, etc., during which there is to be a stream of repayments. In each year a bargain might be struck along the lines discussed earlier. The aim would be to economize on the time of negotiators.

Perhaps this is more important for the debtor's negotiators--the finance ministry and central bank officials--than for the banks. But the creditors could gain even when the economies of scale are all on the side of the debtor since the latter will be prepared to strike a slightly less favorable bargain for the sake of getting a scale-economizing, once-for-all deal.

#### VIII. The Free Rider Problem

So far it has been shown only that some debt relief could be in the interests of the creditors collectively. Such a result is not surprising given that there has actually been a great deal of relief when the latter is defined in an appropriately broad way to embrace rescheduling and concerted lending. The more important current issue is whether sufficient relief has actually been provided. This is likely to hinge on the free rider problem. Consider first the earlier incentives model.

Suppose that bank group A is owed \$40 million in debt and bank group B is owed \$60 million. Assume that, in the absence of relief in period 2, there would be complete default in period 3 since there is no incentive to engage in adjustment effort or investment in period 2. Bank group A then agrees to reduce the contractual value of the debt it holds to \$25 million and this is sufficient to induce the debtor country to engage in extra investment that will raise capacity to pay so as to pay off the whole debt of \$85 million. Bank group B then gets all of its \$60 million thanks to bank group A having given up \$15 million. This is an externality. In this case, it is still in bank group A's interest to provide relief since something is better than nothing. But once uncertainty is introduced, the benefit would not be assured for it.

In any case, the key point is that the marginal product of the debt relief decision is greater for the two groups combined than it is for the one that provides relief. Hence some relief may be provided even though there is no cooperation between the two groups, but, because of the externality, the extent of relief is likely to be less than is optimal from the collective point of view.

A similar kind of story can be told in terms of the model that was used for the investment-capacity argument. Suppose that all the new

lending at interest rate  $r$  is done by bank group A, while bank group B is again the free rider. If all the banks have to share equally in default or endogenous debt relief, then both groups lose from the initial inadequacy of period 3 capacity to pay represented by  $(1 - z) R_3$ . As a result of new lending to cover repayments due in period 2, the total repayment due in period 3 becomes  $rR_2 + R_3$ . But capacity to pay is  $qR_2 + zR_3$  ( $r < q$ , and  $z < 1$ ). Bank group A will thus get a return less than  $q$  for its new lending even though  $q$  is the actual rate of return. Thus, the incentive to make the loan will be less than optimal since some of the benefits go to bank group B. There is certainly no incentive for a bank that did not hold any of the original debt to make the loan unless  $q$  were sufficiently greater than  $r$  or unless its debt were given senior rights. 1/

The argument also applies in the other cases discussed here. A bank that gives debt relief so as to forestall partial default will benefit other banks and may make a loss itself from the operation unless its debt is given senior rights or unless the debtor country completely separates its dealings with different banks. In the latter case, the debtor must be willing to default to one bank and not the other, and would need to negotiate separately with each, in each case seeking to obtain relief so as to avoid default. Such behavior would go contrary to cross-default clauses and to the legal protection that creditors have against others obtaining seniority.

The free rider problem can be overcome in various ways. First, the banks can organize their own collective action, as has happened. But collective action has familiar difficulties, and the banks have been very conscious that a residual free rider problem has remained. Second, the banks can be organized by a third party--i.e., a government or its agency--using enforcement threats of various kinds or just persuasion. This happened in the early stage of the debt crisis, the persuaders or enforcers having been primarily creditor governments. A third possible approach is truly a "market" one. 2/

It is a well-known proposition that when the individual actions of private agents do not lead to joint profit maximization there can be scope

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1/ Dooley (1987) makes the point that the market discount brings about a tendency for investment in debtor countries to be below the optimum, i.e., for the marginal product of capital to exceed the world rate of interest, because new debt is "contaminated" by the probability of default caused by the inherited debt when new debt is not given seniority. Helpman (1988b) shows rigorously (in a model with particular assumptions) the circumstances in which some debt relief will be provided even when there is no cooperation, though it will not be enough from the creditors' collective point of view. He shows that some relief is less likely the greater the number of creditors and the lower the contractual debt. He also shows that there could be multiple non-cooperative equilibria.

2/ I owe the following line of thought to Michael Dooley.

for profitable amalgamations or takeovers, the necessary organization taking place within the new, larger, firm. Indeed, in the present case it is not necessary for firms to be taken over; it is necessary only for one bank to take over the debts of any one country. Indeed, one bank does not need to buy up all the debts owed by one country; it needs to buy only a sufficient proportion to give it an inducement to provide the necessary degree of relief. It will be observed that, in the example of two bank groups given earlier, bank group A did actually benefit itself from relief, even though it did not get all the benefits. Going even further, it is sufficient if a substantial part of debt tends to get concentrated with a limited group of banks, a group small enough for collective action to be organized through the bank negotiating committees.

But there are difficulties in the way of this "market solution." For any one bank, limits to concentration of debt are set by its desire for portfolio diversification and by regulators that prevent or discourage heavy concentration on debt of one country. In practice, banks have traded in developing country debt more to diversify than to concentrate the debt. Furthermore, the scope for particular banks to profit from takeovers or purchases of debt in order to grant relief is limited by the "market price effect": the price of the debt will go up (the market discount will fall) as soon as potential sellers of debt realize that the outcome of the operation will be to raise the prospects of repayment. They will not sell unless they get a higher price, hence eating into the prospective profits of the banks that accumulate the debt and engage in optimal relief. 1/

Taking all this into account--the effects of collective action by banks, the role of pressures and initiatives by creditor governments, especially through supporting concerted lending, and the possible "market" approach just discussed--the current question is whether the free rider problem has been fully overcome and, if it has not, whether significant scope for beneficial action in the collective creditor interest remains.

Advocates of further debt relief may be making any of three assumptions, all of which are sometimes implicit in debt relief proposals. First, they may be assuming that the free rider problem has not been fully overcome, so that there remain unexploited possibilities of gains for creditors collectively. In fact, there is still market failure and thus a

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1/ The effect thus benefits the free riders just as takeovers lead to higher stock prices and benefit existing shareholders. It is the same "market price effect" (discussed in Corden, 1988a) which benefits banks when a debt facility buys up debt from them and then writes down its value to the debtor. Elhanan Helpman has pointed out that if there are rational expectations--the prospective sellers fully understanding the consequences--the market price effect would completely eliminate the potential profits of the initiating banks and so destroy the incentive to engage in this activity. This solution to the free rider problem would then be ruled out.

potential case for further organization by creditors or for intervention by a third party, such as a multilateral institution or creditor government. Second, there may be unexploited possibilities of gain from debt relief because of failure of bank managements to fully appreciate these possibilities; the problem is one of information or understanding, not implementation, and the advocates are just giving advice, like management consultants. Third, the advocates may want more debt relief than is in the interests of the creditors collectively because they are concerned with the interests of the debtors. This aspect falls outside the scope of this paper.

#### IX. Conclusion

To conclude, one might reflect on the significance of the various components of the analysis.

To begin with, the default forestalling argument seems to be a convincing and straightforward explanation for the great amount of rescheduling, restructuring and concerted lending that has taken place (see Watson et al., 1988). In terms of the model, it explains why debt relief was granted for period 2 payments. The concern about negotiating costs and the desire to reduce endogenous uncertainty explains multiyear restructuring agreements.

The ceiling argument against debt relief explains why debt service obligations were financed rather than forgiven--the central theme of Krugman (1988a). In terms of the model, it explains why relief for period 2 led to increased contractual debt for period 3, rather than period 3 contractual debt being reduced. There is always the chance that capacity to pay will rise sufficiently in period 3 so that substantial payments can be made.

The incentives argument may have moderated the build-up of contractual debt in period 3 and might have led to a stretching out of payments which, as has been noted, is equivalent to debt relief. But it is still an open question how strong this argument is empirically. How much relief is needed to provide the optimal incentive? The investment-capacity argument depends crucially on how much of the extra resources that become available to the debtor as a result of debt relief would be used for investment rather than consumption.

Finally, there is the crucial free rider problem. To what extent has it been overcome by collective action or through the market? If all the debt were owned by one bank--or there were a comprehensive organization of banks maximizing the banks' collective interests with no important free riders--would relief have been significantly greater? If the answer is positive, scope for further collective action or for third party intervention--and hence for elaborations of the current "debt strategy"--appears to exist even when the concern is purely with the interests of the creditors or when the aim is to help the debtor, without any adverse effects on creditors collectively.

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