MARKET-BASED DEBT-REDUCTION SCHEMES

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ABSTRACT

Recently much attention has been given to the idea of reducing the debt of developing countries through a "menu approach" of schemes that attempt to harness the discounts on debt in the secondary market. This paper, after reviewing the rationale for the orthodox strategy of concerted lending and the case for debt forgiveness, examines the logic behind several market-based debt reduction schemes. It shows that such schemes will ordinarily benefit both debtor and creditor only when the debtor is on the wrong side of the "debt relief Laffer curve" -- that is, where a reduction in nominal claims actually increases expected payment. This is, however, also the case in which unilateral debt forgiveness is in the interest of creditors in any case. The implication is that there is no magic in market-based debt reduction, as opposed to more straightforward approaches.

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In the early years of the third-world debt problem, there was widespread consensus among creditors, international organizations, and the debtor countries themselves about the kind of solution that was needed. The basic post-1982 strategy was one of financing the debt overhang -- that is, creditors were expected not only to reschedule debt but to engage in concerted, "involuntary" lending. This lending was intended to reduce the burden of outward resource transfer on debtor nations to levels compatible with economic recovery, while growth and inflation were expected to make a growing nominal debt consistent with declining indebtedness as measured by the ratio of debt to GNP or exports. The emergence of this strategy represented a remarkable turnabout from the market-oriented policies that the US had been urging on the IMF only months before the debt crisis broke. Suddenly the market mechanism for credit was discarded. Although the effort was intended to protect the property rights of existing creditors, new lending was expected to be provided as part of a collective decision process, and in an environment where individual lenders acting independently would not have been willing to extend credit. Thus there was, as Carlos Diaz-Alejandro put it, an abrupt socialization of the international capital market.

More recently, the consensus in favor of financing the debt overhang has begun to erode. One kind of challenge has come from

advocates of debt forgiveness, who argue that instead of reducing current resource transfer burdens by providing new money, creditors should offer a once-for-all reduction in the future obligations of countries. This view includes not only those who favor the interests of the countries over those of their creditors, but also many who argue that such forgiveness would actually be in the creditors' interest, reducing debt to levels that are more realistic and thus more likely to be serviced. While the debt forgivers offer a very different prescription from the established strategy, however, they agree in their advocacy of collective action as opposed to laissez-faire.

A different kind of challenge, however, has come from the advocates of market-based solutions to the debt problem. A variety of schemes -- debt buy-backs, securitization, debt-equity swaps -- have emerged in the last few years in an effort to find a way out of the debt problem through voluntary actions on the part of creditors. The advocates of these schemes claim that through a "menu approach" of new financial arrangements, the exposure of banks and the liabilities of countries can be reduced without the need for collectively bargained new money or debt forgiveness. That is, market solutions are being offered as an alternative to the concerted-action strategy that has dominated the handling of the debt problem until now.

Can the market solve the debt problem? Despite the popularity of the new market-based schemes, there has been surprisingly little

sensible discussion of their pros and cons. The purpose of this paper is to provide a framework for thinking about market-based schemes for dealing with debt, and to compare them with more orthodox strategies of financing and forgiveness.

The paper is in six parts. The first part reviews the rationale for the original strategy of rescheduling and concerted lending. The second considers the alternative case for debt forgiveness, with emphasis on the conditions under which forgiveness is in the interests of creditors as well as debtors (conditions that turn out to be crucial for the evaluation of market-based schemes). I then consider three kinds of market-based debt scheme: buybacks, securitization, and debt-equity swaps. The final section of the paper offers some tentative evaluations.

1. The rationale for concerted lending

The defining feature of a problem debtor is its inability to borrow on a voluntary basis -- its lack of normal access to international capital markets. The essence of the concerted lending strategy followed since 1982 has been to substitute non-market sources of finance for the normal ones: to use a combination of official lending and involuntary lending from existing creditors to supply debtor nations with sufficient foreign exchange to service their debts. To many observers this strategy has seemed absurd. After all,

what sense does it make to lend still more to countries that already owe more than they are expected to repay? It is important as a starting point to understand the rationale for new lending to problem debtors.

This rationale is often stated in terms of the distinction between liquidity and solvency: a country is asserted to be worth lending to if it is solvent (i.e., is expected to be able to repay its debt eventually) but not liquid (lacks the cash to service its debt on a current basis). However, this distinction is a misleading one for the debt crisis. If it were known that a country were solvent, it would be able to borrow on a voluntary basis, and there would be no liquidity problem. The liquidity problem arises precisely because there is a possibility that the country will not be able fully to repay its debt -- specifically, because there is a sufficiently large possibility of nonpayment that the expected present value of repayment is less than the debt already outstanding (see Krugman (forthcoming)).

Why, then, should creditors lend still more to such a country? Because while incomplete payment is possible, it is not certain. Suppose that a country might be able eventually to make payments equal in present value to its outstanding debt, but that the risk of nonpayment is sufficiently large that it cannot borrow on a voluntary basis. Then in the absence of concerted action by its creditors, the country will either have to meet its obligations out of current resources or, if this is impossible, default immediately. The latter

will guarantee that creditors do not get all that they are owed, foreclosing the possibility of benefitting from any later good fortune on the part of the country. It may therefore be in creditors' interest to postpone at least part of a country's obligations, avoiding a current default and preserving at least the possibility of a favorable outcome later on.

A country's obligations to amortize debt can be postponed by rescheduling of principal, which is a standard procedure. However, for heavily indebted countries this is not enough, since even the interest payments on debt exceed what they can reasonably be expected to pay out of current resources. Thus there is a need to postpone interest obligations as well. Such a postponement could be achieved directly, through interest capitalization, but this has so far been opposed strongly by creditors because it makes the process excessively automatic (and perhaps also excessively transparent). Instead the method has been to round up existing creditors and require them to provide new loans that cover a fraction of interest payments, effectively deferring interest obligations. This is the process of "involuntary" or "concerted" lending.

The potential gains from concerted lending were argued strongly in the well-known study by Cline (1983) and have been demonstrated in formal models (see Sachs (1984), Krugman (1985)). The point may be seen informally if we think in terms of the subjective discount on debt -- the percentage by which existing creditors expect the present

value of actual repayments on debt to fall short of a country's legal obligations. Suppose that creditors believe that if no concerted lending is undertaken, a country will be forced into a disorderly default in which creditors will receive only a fraction (1-d) of the nominal value of their claims. Suppose also that they believe that a sufficiently large program of concerted lending -- say lending L dollars -- will reduce the expected loss from d to d*. Then it is straightforward to see how such a program can produce a net gain. Each additional dollar lent as part of the concerted lending program is lent at an expected loss of d*; however, the program increases the value of existing debt by (d-d*)D, where D is the initial stock of debt outstanding. Thus the benefits of the program to creditors exceed its cost as long as d*L < (d-d*)D, or as long as L/D < (d-d*)/d*.

To take an example, suppose that absent a program of concerted lending the subjective discount would be .5 -- creditors would expect to get only half of what they are owed -- but that with a program that avoids immediate default the discount falls to .25. Then it is in the interest of creditors to pursue such a program as long as L/D < 1 -- that is, as long as the increase in their exposure is less than 100 percent!

It is important to notice that this example clearly shows the fallacy of some common arguments against the process of lending to problem debtors. It is not true, for example, that the existence of a

secondary market discount on debt (presumably more or less equal to the subjective probability of nonpayment d) means that new money should not be put in. It only means that such new money will not be provided voluntarily -- but that is by definition true of a problem debtor. It is also therefore not true that unwillingness of lenders other than the existing creditors to provide funds, or for that matter export of capital by domestic residents, are arguments against provision of new money by the creditors.

While thinking of the problem in this way makes the potential benefits of concerted lending clear, however, it also makes clear one of its problems. The gains from concerted lending are collective. They arise because by lending enough to avoid immediate default creditors raise the value of the claims they already have. However, looked at in isolation, each new loan is made at a loss. Thus nobody who is not already a creditor of the problem country will be willing to lend, and even existing creditors will lack an individual incentive to lend. We therefore have the now-familiar free-rider problem, in which lending may be in everyone's collective interest but fails to take place because no individual finds it in his or her interest. The process of concerted lending, with creditors negotiating collectively, with pressure from creditor central banks and international agencies, and with the not-too-implicit threat by countries to declare moratorium if new money is not provided, is designed to overcome this free rider problem. In practice, the problem remains serious -- not just because

it has been difficult to get agreements to provide new money, but because of capital flight that in effect free-rides on the provision of new money by banks and official agancies.

Even aside from the free-rider problem, however, there are important objections to the strategy of concerted lending. The crude complaint against such a strategy is that it simply puts heavily indebted countries deeper into debt. Clearly this is not right. As many have emphasized, in a world where countries can grow and where there is still some inflation it is possible for nominal debt to grow yet for a country to become more creditworthy over time (see, for example, Feldstein (1986)). In fact, however, problem debtor nations have grown much more slowly since the onset of the debt crisis than before, and partly as a result their debt indicators have improved little if at all. To at least some extent the slow growth can be attributed to the debt burden itself. This at least raises the possibility that the insistence of creditors on maintaining the full extent of their claims on debtor nations may be self-defeating, reducing their expected repayment below what might be achieved through a settlement that reduces countries' debt burden.

The possibility that less may be more -- that a reduction in the debt burden of highly indebted countries, rather than financing that simply postpones debt repayment, might be to everyone's advantage -- underlies the case for a replacement of the strategy of financing debt with forgiving it.

2. The analytics of debt forgiveness

Why should creditors ever forgive debt rather than postpone repayment? If the stream of payments from the debtor were unaffected by the burden of the debt, it would always be preferable to maintain the nominal value of creditors' claims. After all, even the most seemingly hopeless debtor might conceivably discover a valuable mineral resource or experience an unexpected surge of economic growth, and it makes sense for the creditors to preserve the option of benefitting from such good fortune if it arises. If they reduce the obligations of a country, they have sacrificed this option.

However, the potential repayment of a country is not independent of its debt burden. When a country's obligations exceed the amount it is likely to be able to pay, these obligations act like a high marginal tax rate on the country: if it succeeds in doing better than expected, the main benefits will accrue, not to the country, but to its creditors. This fact discourages the country from doing well at two levels. First, the government of a country will be less likely to be willing to take painful or politically unpalatable measures to improve economic performance if the benefits are likely to go to foreign creditors in any case. Second, the burden of the national debt will fall on domestic residents through taxation, and importantly

through taxation of capital; so the overhang of debt acts as a deterrent to investment.

Over and above these costs to potential repayment is the fact that no clean Chapter XI proceeding exists for sovereign debtors, and a confrontational and disorderly default may reduce the actual recepits to a creditor below what could have been obtained if debt had earlier been reduced to a level that could have been paid.

The upshot of these negative effects is that the higher is the external debt of a country, the larger the probability of nonpayment; and thus the greater the subjective discount on that debt. If debt is high enough, further increases in the level of debt may actually lead to a _smaller_ expected value of payments[1].

A useful way to think about the relationship between debt and expected repayment is in terms of the curve CD illustrated in Figure 1. On the horizontal axis is the nominal value of a country's debt; on the vertical axis the actual expected payments. At low levels of debt nominal claims may be expected to be fully repaid, so that the outcome lies along the 45 degree line. At higher levels of debt, however, the possibility of nonpayment grows, so that the expected payment traces out a curve that falls increasingly below the 45 degree line. At a point such as L the ratio of expected payment to nominal debt may be measured by the slope of a ray from the origin; ignoring risk and transaction costs, we may regard this as approximating the secondary market price of debt.

Although increased levels of debt above point C will be associated with lower secondary market prices, at first the total value of debt will still rise. At high enough debt levels, however, the disincentive effects discussed above may be large enough so that the curve actually turns down.

We may now ask: under what conditions will a reduction in nominal claims -- i.e., debt forgiveness -- actually leave the creditors better off? Many authors have suggested that when debt sells at a discount on the secondary market creditors should "recognize reality" and reduce their claims on the country correspondingly. However, it is clear from Figure 1 that this is not necessarily right. At point L there is a secondary discount, but a reduction in the claims of creditors would still reduce what they expect to receive overall. The reason is implicit in the discussion of the previous section. Given the uncertainty about the future, a reduction in claims deprives creditors of the option value of sharing in good fortune. Only if this option value is outweighed by the improved incentives offered by a debt reduction do the creditors gain by passing on part of the secondary discount to the debtor. This is going to happen only if the debt burden is very large, so that these incentive effects predominate, at a point like R.

The curve DRLC should by now be a familiar sort of object. It is the Debt Relief Laffer Curve. That is, just as governments may sometimes actually increase tax revenue by reducing tax rates,

creditors may sometimes increase expected payment by forgiving part of a country's debt. In both cases the proposition that less is more depends on an initial extreme situation, whether of taxes that provide extreme disincentives or of a debt burden that is crippling in its effect on economic growth. Arguments that debt relief is in everyone's interest are, in effect, arguments that countries are on the wrong side of the debt relief Laffer curve.

Now of course in practice it is very difficult to ascertain which side of the curve a highly indebted country is on. There is a consensus that hugely indebted countries with weak governments like Bolivia are on the wrong side, and this has led to granting of debt relief with few arguments. But for the major debtors the question is anybody's guess.

In spite of the difficulty of applying the concept of the DRLC in practice, it remains useful as a way of organizing our thinking. For one thing, it is worth knowing what we don't know -- the Figure makes it clear that both the confidence that secondary discounts can be freely passed on to debtors and the hard-line view that debt should never be forgiven are wrong in principle. Equally important, the DRLC is useful as a way to think about the market-based schemes for debt reduction that have recently gained so much prominence. For it turns out that the prospects for success of these schemes are intimately tied to where on the debt relief Laffer curve we are.

The reason should be apparent. Market-based debt reduction schemes, while they are sometimes aimed at producing other benefits, are in large part intended to "harness" the discount in the secondary market to the mutual benefit of debtor and creditors. As we have just seen, however, when concerted debt relief is considered, a secondary discount offers the possibility of mutual gain only when the debt is large enough to put the country on the wrong side of the curve. Can a market-based scheme harness the discount where collective action cannot? As we will see, it can't -- mutually beneficial debt reduction through market-based schemes is possible only under the same circumstances as mutually beneficial debt relief.

3. Debt buybacks

Some of the problem debtors have accumulated substantial foreign exchange reserves, and others could possibly choose to run large enough trade surpluses to do the same. At the same time, the debts of these countries continue to trade at substantial discounts, reflecting doubts about the willingness or ability of the countries to continue to achieve such favorable trade performance. This raises an obvious possibility for reducing countries' debt through voluntary action rather than concerted debt forgiveness. Simply let them buy back their own debt on the secondary market, and the effect will be to reduce

debt even net of foreign exchange reserves, because of the discount at which the debt sells. Is there anything wrong with this?[2]

Now legally debtors are normally prohibited from repurchasing their own debt at a discount. The reasons are twofold. First, there is the issue of seniority. Use of reserves to repurchase debt may impair the debtor's ability to repay the remaining debt, and existing creditors are entitled to first claim on whatever repayment the debtor is in fact able to make. In addition, there is a moral hazard problem: allowing debtors to buy back their debt at a discount rewards the least reliable, who therefore have the lowest secondary prices.

If it is decided that buybacks are in the interest of both debtors and creditors, the moral hazard argument may be something that can be dealt with. For one thing, conditionality could be applied to the granting of permission for buybacks. There are no doubt practical problems with this, but these may be left aside to focus instead on the question of whether it is in the interest of creditors to allow buybacks.

To get some insight into this, it is useful to consider a simple numerical example, illustrated in Table 1. Here we imagine a hypothetical country that owes its creditors $100 billion, and which has uncertain prospects of repayment. Ignoring the question of when the country can make payments, we simply assume that there are two possibilities: a "bad" state in which the country can generate only $20 billion of foreign exchange, and a "good" state in which it can

generate something more than $100 billion, say $110 billion. We also assume that the country starts with foreign exchange reserves of $5 billion. The probability of the bad state is 2/3, that of the good state 1/3.

Consider first what happens if there is no buyback. Then in the bad state the creditors collect 25 -- the foreign exchange the country is able to earn, plus the reserves it has available. In the good state the country pays the 100 it owes. Thus the expected payments to creditors are 25*(2/3) + 100*(1/3) = 50. Ignoring risk, the secondary market price on the country's debt will be .5.

Now suppose that the country uses its foreign exchange reserves to buy back part of its debt. Let us also initially suppose that the buyback has no impact on the probability of a good outcome -- which as we will see is crucial. At a secondary market price of .5, the foreign exchange reserves can be used to buy back $10 billion of debt, reducing the outstanding debt to $90 billion[3]. Those creditors who sold out will receive $5 billion, whatever happens. Those who did not will receive $20 billion in the bad state (because the foreign exchange reserves are now gone) and $90 billion in the good state. Has the change hurt or helped the creditors?

The answer is that it has hurt them. The expected payments to the creditors are 5 in either state (the value of debt sold off in the secondary market) plus 20 in the bad state, plus 90 in the good state, implying expected payments of

$$5 + 20*(2/3) + 90*(1/3) = 48 \ 1/3$$

That is, the buyback reduces the expected total payment to the creditors. The effect of a buyback in this case should be to <u>lower</u> the price of debt on the secondary market, and make the creditors worse off.

The reason for this result is that the buyback reduces the net contribution of the country in the good state, when it could repay its whole debt but now gets to pay less, while it has no effect in the bad state, when the country in any case pays all that it can. So the country gains at creditors' expense. It should be clear that this is a fairly general result. If a country's ability to pay is not affected by a buyback, then the buyback reduces the net payments by a country when it can pay and produces no gains for creditors when it cannot.

The only way that this result could be reversed is if the buyback improves the country's ability to pay by a sufficient amount to offset this negative effect. The incentive effects indeed work in that direction. Consider the benefits to the country of having the good state occur. In the bad state the creditors take whatever the country can give. In the good state the country gets to keep any excess above its nominal debt. We have assumed that the country's foreign exchange earnings are 110 and its reserves 5, while its debt is only 100; so in the absence of a buyback it gets to keep 15 in the good state. After a

buyback its reserves are gone, but its debt is reduced to 90, so in the good state it gets to keep 20. This greater gain in the good state should provide a greater incentive for the country to pursue adjustment policies, to invest, etc.. -- all those things that we think the country can do to increase its future ability to pay.

The creditors may, then, benefit from a buyback, but only if the increased probability of the good state is enough to outweigh the loss of their rights to share in the good fortune if it comes. But this is exactly the condition that we saw was necessary for creditors to benefit from debt forgiveness. So in fact it is only in the interest of creditors to allow buybacks of debt on the secondary market when the debtor country is on the wrong side of the debt relief Laffer curve.

We can see the equivalence precisely in the context of our numerical example. Suppose that instead of allowing the country to buy back part of its debt, the creditors had instead simply reduced the face value of outstanding claims from 100 to 95. Then the aggregate payments to creditors would be the same as in the buyback case: 25 in the bad state, 95 in the good. Also, in the good state the country would have the same amount of foreign exchange left over: earnings of 110, less debt of 95, plus reserves of 5 = 20. Thus the incentive to increase the probability of the good state would be the same. It follows, then, that allowing buyback on the secondary market will benefit creditors if and only if debt forgiveness would do the same.

This suggests that creditors will not readily agree to buybacks unless they are convinced that debt forgiveness is definitely desirable -- which therefore also implies that debt buybacks are not going to be in any meaningful sense an alternative to the collective-action strategies that were discussed in the first two sections of this paper.

4. Securitization

Debt buybacks are limited in their possible extent by the quantity of foreign exchange reserves available. Recently, however, investment bankers have proposed a way in which this limitation might be overcome. The idea of securitization is that a country issues new debt in the form of bonds that either are sold for cash that can then be used to repurchase debt on the secondary market, or are directly exchanged for debt (as in the recent Morgan-Mexico deal). If the new bonds sell at a smaller discount than existing debt, the effect will be to reduce the debt outstanding without any expenditure of foreign exchange reserves by the debtor.

What should be immediately clear -- although it has been obscure in most practical discussions -- is that such schemes will work only if the new debt is somehow made senior to the existing debt. If the new debt is not senior, it will face the same probability of non-payment as the existing debt, and should therefore sell at the same

discount. This will mean that there will be no prospect for a
reduction in net debt. Suppose, for example, that a country's existing
debt sells at a 50 percent discount, and that the country attempts to
reduce its debt through a securitization scheme involving the issue of
$10 billion in face value of new bonds. If these are not senior to the
existing debt, we can suppose that they will sell for only $5 billion;
this will allow retirement of $10 billion of old debt, but the country
will still end up exactly where it started. (This also confirms that
the discount should not have changed). So securitization depends on
making the new debt senior to the old, with some perceived first claim
on payments.

Such seniority is difficult to achieve. A sovereign debtor cannot
make a truly credible commitment to service some of its debt more
reliably than others, since any default puts it outside international
law anyway. Nonetheless, it may be possible in some cases to establish
de facto seniority. In the Morgan-Mexico plan the de facto seniority
was supposed to come from the fact that the new debt took the form of
bonds rather than bank loans. Since 1982 Mexican bonds have not been
subject to reschedulings and new-money requests, essentially because
of their relatively minor importance and the difficulty of achieving
collective action from bondholders. So the Mexican government claimed
that the new bonds should be regarded as effectively senior to the
existing bank debt. In practice they were only marginally successful

in this: a few bonds were sold at a discount somewhat smaller than that on bank debt, but most of the offering went untaken.

Suppose, however, that it were indeed possible to establish the principle that new securities issued to retire part of existing debt are senior to the old debt remaining. Would such a securitization plan be in the mutual interest of debtors and creditors? We can show that the problem is exactly analogous to that of debt buybacks, and that the answer once again depends on which side of the debt relief Laffer curve the debtor is on.

Table 2 shows an example that is designed to stress the parallel with the example we used to examine debt buybacks. We consider a country that has an initial debt of $100 billion, and that in the "bad state" can pay 25, in the "good state" generates resources of 115. The probabilities of the two states are again 2/3 and 1/3 respectively, so that in the absence of a securitization plan the expected repayment is 50.

Now suppose that the country issues $5 billion of new bonds that are somehow guaranteed to be senior to the existing debt. These bonds will be fully repaid even in the bad state, so they will sell at full face value, and can therefore be used to buy back $10 billion of old debt[4]. The country's net debt will therefore be reduced to 95.

The parallel with the case of a buyback should now be apparent. In the bad state the new creditors receive 5, the old creditors 20, for a total payment of 25. In the good state the new creditors also

receive 5, the old creditors 90, for a total payment of 95. So if the probability of a good state has not been increased by the package, the total expected payments to creditors have been reduced to

$$(2/3)*25 + (1/3)*95 = 48 \ 1/3$$

In order to make creditors better off, the probability of the good state must rise enough to compensate for creditors' loss of the option of benefitting as much from that state. The incentive for the country to increase the probability of the good state rises, just as in the buyback case: before the debt reduction, the country gets to keep 115 - 100 = 15 in that state, after the debt reduction it gets to keep 115 - 95 = 20. Thus just as in the buyback case, a debt reduction can benefit the creditors, but only if the debtor is on the wrong side of the debt relief Laffer curve.

It is also apparent that a straightforward debt forgiveness, reducing debt from 100 to 95, will have precisely the same effects as the securitization scheme.

5. Debt-equity swaps

The most publicized market-based scheme for debt reduction is the use of deals in which creditors sell debt at some discount in return for local currency that must be invested in equity. In some of the

more enthusiastic descriptions of such swaps, the impression has been given that they solve all problems at once: that they could simultaneously provide a source of capital inflow and cancel countries' external obligations (see, for example, World Financial Markets, September 1986).

In fact, a debt-equity swap neither provides a capital inflow nor cancels a country's obligations. The foreign investor does not bring foreign exchange to the country, since it is the country's own debt that is presented to the central bank; thus there is no capital inflow. The country's obligations are not cancelled; the foreigners acquire an equity claim on the country to replace their previous claim. What has really happened is essentially the same as what happens in securitization. The country has exchanged a new kind of liability for some of its existing liabilities.

Now a first question about this exchange is whether it can lead to a net reduction in the country's external obligations by harnessing the discount in the secondary market. The answer should be immediately clear when we realize that a debt-equity swap is a kind of securitization: the country can capture the secondary market discount to the extent that the new claims are regarded as senior to the old. In the current political and economic climate it is widely expected that direct foreign investors will be allowed to repatriate earnings and/or use their profits as they wish within the debtor nations, even if these countries are failing to repay debts fully. This has allowed

debt-equity swaps to capture part of the discount, though by no means all. However, once one realizes that the ability to reduce net obligations through debt-equity swaps depends on seniority of equity (which is itself a fairly weird idea), the limitations become apparent.

While debt-equity swaps are at a fundamental level a kind of securitization, the fact that the assets involved are so different introduces three other considerations that do not arise in securitization schemes involving issue of bonds. These are the effects of the swaps on the timing of payment; the possibility of "round-tripping" or other diversions of capital inflows; and the fiscal impacts.

In principle, exchanging a debt for equity should have a favorable effect on a country's timing of obligations. Where even a rescheduled debt requires a country to make a stream of payments that is flat in nominal terms, an equity claim on a country will normally provide a stream of repatriated earnings that rises over time with both growth and world inflation, and that is therefore lower at the beginning, higher later. Thus converting debt to equity can serve the same purpose that concerted lending is supposed to serve, of postponing payment to a time when the country is presumed likely to be more able to make it. An ideal debt-equity swap would clearly loosen the short-run liquidity constraint on a problem debtor.

In practice debt-equity swaps will not always be ideal, and it is unfortunately easy for them actually to <u>worsen</u> the immediate foreign exchange position of countries that allow them. The most extreme case is that of "round-tripping": after swapping debt for equity, an invvestor then sells the equity and withdraws the proceeds from the country. In this case the debt-equity swap ends up being in effect a use of foreign exchange reserves to buy back debt on the secondary market, probably at less than the full discount. (Of course if investors know that they can get away with round-tripping, they will be prepared to pay the full discount for the right to carry out the transaction).

Even if literal round-tripping does not occur, debt-equity swaps can still consume foreign exchange on net. Suppose that a foreign firm uses a debt-equity swap to carry out an investment that it would have undertaken anyway. Had it carried out the investment without a swap, it would have brought foreign exchange to the central bank to exchange for local currency with which to make the investment. When it does the swap instead, this foreign exchange inflow fails to occur. So in effect the central bank has used some of its own foreign exchange reserves to make a purchase of debt on the secondary market.

It is important to notice that the net impact on foreign exchange reserves from a debt-equity swap is not, as many people continue to think, a tradeoff between the capital inflow aspect and the diversion through round-tripping and substitution for alternative financing. At

best, in the case of an ideal swap that represents 100 percent "additionality", there is a zero capital inflow; any round-tripping or substitution turns this into a net capital outflow. Since in practice there is bound to be some leakage, realistically debt-equity swaps are a mixture of securitization and buyback.

However, the securitization involved in debt-equity swaps is very different in its fiscal effects from straight securitization. In straight securitization the debtor government offers a new asset in exchange for old debt; in a debt-equity swap it offers assets belonging to the private sector. To make this offer, the government must provide the local currency with which to buy these assets; this currency issue will be inflationary unless offset by domestic borrowing. In the latter case the counterpart of the foreign investor's swap of debt for equity is a debtor swap of foreign for domestic debt.

So far so good; but many debtor governments have a domestic debt problem as well as a foreign debt problem. They have large budget deficits, so that anything that aggravates the budget deficit has a real cost; and, crucially, they pay much higher real interest rates on their internal debt than they do on their external debt -- say 20 percent versus 5. So even if a debt-equity swap does not have a large negative effect on foreign exchange reserves, it is virtually certain to aggravate a debtor country's fiscal problems.

As this discussion shows, debt-equity swaps are quite complex in their effects, and difficult to evaluate even after the fact. They are in principle a kind of securitization that has the additional advantage of tilting the stream of payments away from the present and toward the future, but they are in practice likely to involve buyback of debt at a higher effective price than the secondary price, and will typically aggravate debtor fiscal problems.

Will creditors benefit from debt-equity swaps? To the extent that these swaps are a combination of buyback and securitization, the answer depends as usual on the debtor's position on the debt relief Laffer curve. The financing aspect may improve the debtor's prospects as well, while the fiscal consequences will tend to reduce creditworthiness. There is also an important though not too laudable possibility for gain: that the countries may mishandle the swaps in such a way as to allow those who get the chance to make swaps to make substantial rents.

6. Summary and conclusions

The main conclusion of this paper may be stated bluntly: there is no magic in market-based schemes for debt reduction. The secondary market discount on developing country debt does not automatically constitute a resource that can be harnessed to provide free debt relief; in many circumstances repurchase of debt on the secondary

market, whether through reserve-financed buybacks or through creation
of new, senior securities, will hurt existing creditors. There is a
mutual benefit from such repurchases only when a reduced debt burden
strongly increases a country's likely ability to repay -- the same
situation in which unilateral debt forgiveness is in the interests of
creditors in any case.

The most heavily advertised scheme for market-based debt
reductions is the use of debt-equity swaps. This paper has argued that
such swaps are in principle a kind of securitization; that "round-
tripping" and other leakages tend to make them degenerate into
buybacks financed by reserves; and that they are likely both to be
disappointing in terms of their ability to capture the secondary
market discount and costly in their effects on countries' fiscal
positions. While there are potential advantages as well, the claims
made for debt-equity swaps by their sponsors are clearly exaggerated.

Clearly, then, market-based debt reduction cannot serve as an
alternative to the orthodox strategy of rescheduling and concerted
lending. Schemes that benefit the debtor at the expense of the
creditor -- such as buybacks and securitization for countries not on
the wrong side of the debt relief Laffer curve -- will be opposed by
existing creditors when they become more than marginal. Schemes that
benefit the creditors at the expense of the debtor -- such as debt-
equity swaps that fail to capture the secondary discount, while
allowing firms to make investments they would have made in any case --

will be opposed by the debtors as their effects become clear. Mutual agreement on schemes will come only when, as in the recent Bolivian case, there is more or less universal agreement that the debtor is so heavily indebted that a reduction in claims actually increases expected repayment.

TABLE 1: EFFECTS OF A BUYBACK

	Bad state	Good state
Foreign exchange generated*	20	110
A. No buyback		
Payments to creditors	25	100
Residual benefit to country	0	15
B. Reserves used for buyback		
Payments to creditors who sell out	5	5
Payments to other creditors	20	90
Total payments	25	95
Residual benefit to country	0	20

*Country is assumed initially to have 5 in reserves

TABLE 2: EFFECTS OF SECURITIZATION

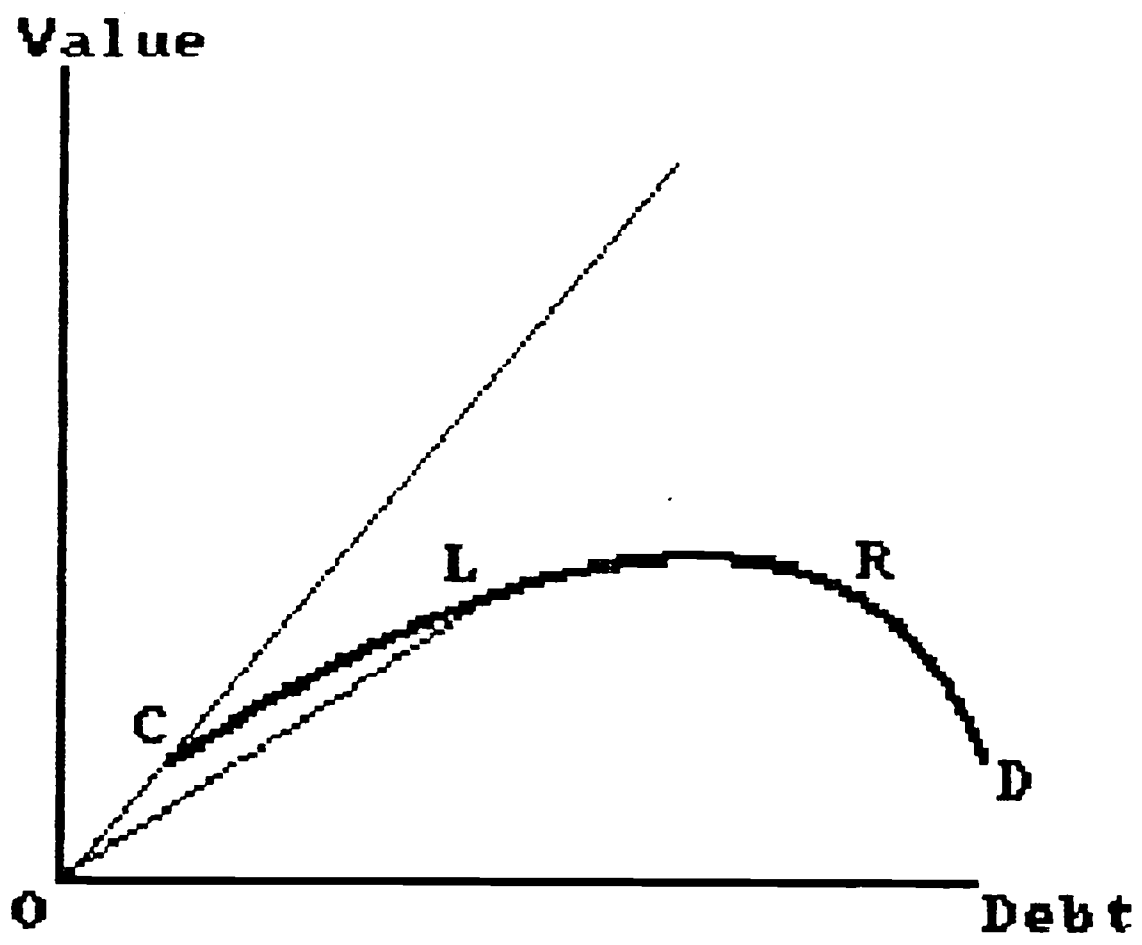|	Bad state	Good state
Foreign exchange generated	25	115
A. No securitization		
Payments to creditors	25	100
Residual benefit to country	0	15
B. Senior bonds exchanged for part of debt		
Payments to new creditors	5	5
Payments to other creditors	20	90
Total payments	25	95
Residual benefit to country	0	20

Figure 1

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NOTES

1. If there is no uncertainty about the future, then it is always in the interests of creditors to forgive debt down to the level at which it will be repaid (see Sachs (forthcoming)). In this case any secondary discount would constitute a case for debt forgiveness. Unfortunately, this is not the case when the future is uncertain.

2. Debt buybacks at a discount were actually quite common in the 1930s. See Portes (1987).

3. Actually this is not quite right, because the secondary market price of the debt will change as a result of the buyback, and the amount purchased will depend on the post-buyback equilibrium price, not the pre-buyback one. For a marginal change, however, this makes no difference, and by focussing on the total returns to creditors we bypass the problem in any case.

4. The same qualification as in the previous footnote applies: actually the price at which the bonds trade for old debt will be the post-securitization discount, which changes as a result of the action itslef. But the analysis is exactly right for marginal changes, and

the key point of total returns to creditors is correct.

APPENDIX: A FORMAL MODEL OF FORGIVENESS, BUYBACKS, AND
SECURITIZATION

A key point in the text was that the condition under which it
is in creditors' interest to allow buybacks, whether financed out
of foreign exchange reserves or by the issue of new, senior
securities, is the same as that under which it is in their
collective interest to reduce a country's debt obligations --
namely, when the country is on the wrong side of the "debt relief
Laffer curve", so that a reduction in the country's nominal
obligations actually increases its expected repayment. In the text
this point was suggested verbally and with numerical examples;
here I make the point with a simple formal model. The model is
closely based on an earlier model of mine (Krugman 1988), but is
even further simplified in order to allow market-based
debt-reduction schemes to be introduced with a minimum of
complication.

Consider, then, a country that may not be able to repay all
of its external debt. We assume for simplicity that there are only
two possible states of the world: a "bad state" in which the
country definitely cannot repay all its debt, and a "good state"
in which the country definitely can. The maximum trade surplus
that the country can run in each state is F_B, F_G. The actual

1

payment made in each state is T_B, T_G.

Creditors are assumed to able to make the country pay all that it can, up to the level of its debt obligations. In the bad state, this implies

$$T_B - F_B + R \tag{1}$$

where R is the country's foreign exchange reserves. In the good state, the country simply pays what it owes:

$$T_G - D \tag{2}$$

where D is the country's debt.

Let S be what the country has "left over" after paying its creditors -- that is, the sum of feasible trade surplus and foreign exchange reserves, less actual payment. We have

$$S - F + R - T \tag{3}$$

in each state.

Now a key element of any case for debt forgiveness must be an incentive effect from debt on a country's ability to repay. We introduce this by assuming that the probability of the "good state" depends on how hard the country tries, as measured by a variable we can call adjustment effort, A:

$$p_G - h(A) \tag{4}$$

2

The country is assumed to dislike making an adjustment effort, but to like receiving a surplus S; in particular, the country's objective function may be written[1]

$$U = S - V(A) \qquad\qquad (5)$$

Since the country must make an adjustment effort before it knows whether the state will be good or bad, and since there is something left over for the country only if the state is good, we have an expected value of the country's objective function

$$EU = h(A)[F_G + R - D] - V(A) \qquad\qquad (6)$$

where the term in brackets is what is left over to the country in the good state. Since the country will maximize this with respect to A, and since the country's choice of A determines the probability of a good state, we may write the outcome of the country's maximization as

$$P_G = P_G(F_G + R - D) \qquad\qquad (7)$$

with $P_G' > 0$.

Next consider the expected receipts of the country's

[1]The reason for assuming that the country's objective function is linear in S is in order to purge the problem of any risk sharing aspects -- not that these may not matter, but they do not seem central to the issue at hand.

3

creditors. We can write the expected value of repayments as

$$ET = p_G D + (1 - p_G)[R + F_B] \qquad (8)$$

And we can now ask: does a reduction of nominal debt raise or lower the expected repayment? Clearly,

$$\partial ET/\partial D = p_G - p_G'[D - R - F_B] \qquad (9)$$

A reduction in debt will therefore increase expected repayment -- that is, we are on the wrong side of the debt relief Laffer curve -- whenever $p_G - p_G'[D - R - F_B] < 0$. The interpretation of this condition is that the positive incentive effects of the debt relief must outweigh the cost to creditors of the fact that they get paid less in the good state.

Buybacks

Now we consider what happens if a country is allowed to use part of its foreign exchange reserves to buy back debt on the secondary market. We assume that the secondary market price of a dollar of debt is simply the expected payments on that debt, so that

$$\sigma = ET/D \qquad (10)$$

where σ is the seondary market price.

Suppose that a small quantity of reserves -dR is used to

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repurchase debt on the secondary market. These reserves will buy back a larger nominal value of debt, so that

$$dD = \sigma^{-1}dR \qquad (11)$$

The fact that debt falls by more than reserves means that the country will have more "left over" in the good state, so that it will have an incentive to do more adjustment, raising the probability of that state occurring:

$$dp_G = p_G'[dD - dR] = p_g'[1 - \sigma^{-1}]dR \qquad (12)$$

The change in the secondary market price reflects both any change in the expected payments and the fact of a smaller remaining debt:

$$d\sigma = D^{-1}[dET - \sigma dD] = D^{-1}[dET - dR] \qquad (13)$$

But the change in expected repayment is

$$
\begin{aligned}
dET &= (1-p_G)dR + p_G dD + [D-R-F_B]dp_G \qquad (14)\\
&= dR + p_G(\sigma^{-1}-1)dR - p_G'[D-R-F](\sigma^{-1}-1)dR
\end{aligned}
$$

Substituting back into (13), we find

$$d\sigma = D^{-1}(\sigma^{-1}-1)\{p_G - p_G'[D-R-F_B]\}dR \qquad (15)$$

5

A buyback that uses part of reserves (dR < 0) willtherfre produce a rise in the secondary price, benefitting creditors, if and only if $P_G + P_G'[D - R - F_B] < 0$. This is precisely the condition for a reduction in debt to raise expected payment. So allowing a buyback will benefit creditors only if the country is on the wrong side of the debt relief Laffer curve.

Securitization

Next suppose that the debtor country is able to issue new debt in exchange for old, and that this new debt is somehow made effectively senior to the old, so that it receives first claim on available resources in the bad state. We will suppose that a small quantity of new debt dN is issued. Since the new debt is senior, it will trade at par, and can be used to retire old debt at the secondary market price:

$$dD = -\sigma^{-1}dN \qquad (16)$$

In the bad state, the new debt gets served first, and old debt receives only what is left:

$$T_B = F_B + R - N \qquad (17)$$

As before, the incentive for a country adjustment effort depends on what is left over after paying both new and old debt; thus we can write

6

$$P_G = P_G(F_G + R - D - N) \tag{18}$$

Now consider the effect of issuing some new debt on the expected payments to the remaining creditors:

$$dET = -(1-p_G)dN - p_G\sigma^{-1}dN + p_G'[D-F_B-R](\sigma^{-1}-1)dN \tag{19}$$
$$= -dN + \{p_G - p_G'[D-F_B-R]\}(\sigma^{-1}-1)(-dN)$$

Substituting back into (13), this gives us the change in the secondary market price

$$d\sigma = D^{-1}(\sigma^{-1}-1)\{p_G - p_G'[D-F_B-R]\}(-dN) \tag{20}$$

As in the case of a buyback using reserves, the value of the remaining debt increases if and only if $p_G - p_G'[D-R-F_B] < 0$ -- that is, if the country is on the wrong side of the debt Laffer curve.