IMF WORKING PAPER

WP/88/39

INTERNATIONAL MONETARY FUND

Research Department

Analysis of Self-Financed Buy-Backs and Asset Exchanges

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May 10, 1988

Abstract

Buy-backs of external debt financed by the debtor through asset sales generally result in unchanged or lower market prices for remaining debt. The contractual value of debt is reduced by some multiple of the market value of assets sold. The use of assets as collateral for new debt that is exchanged for old debt has effects equivalent to buy-backs financed by sales of the same assets.

This paper explores the possibility that market discounts on the external debt of many developing countries offer opportunities for debtor countries to retire debt on favorable terms. Debt could be retired through buy-backs financed by sales of debtors' financial or real assets or by borrowing. Alternatively, a debtor country might collateralize a new debt instrument by dedicating a financial or real asset to the service of the new instrument, and then offer to exchange the new for old debt.

Such "self-financed" buy-backs of existing debt differ in an important respect as compared to buy-backs financed by a third party. 1/ In most cases, buy-backs financed by a third party benefit the debtor both through a reduced discount on its external debt and through reductions in both the contractual value of debt service payments and the present value of expected debt service payments. An important assumption behind this result is that since the buy-back is financed by a third party, the capacity of the debtor country to make payments to nonresidents may not be affected by the buy-back. Self-financed buy-backs will usually reduce the debtors ability to service remaining debt. 2/ As a consequence, such buy-backs will generally not reduce the discount on remaining debt, nor will it reduce the expected value of debt service payments net of expected earnings on the asset sold. A self-financed buy-back will, however, reduce the contractual value of debt by some multiple of the value of the buy-back.

The intuition behind these results is straightforward. If a country sells a real or financial asset to finance a buy-back, the earnings from that asset are no longer available to make payments on the remaining debt. 3/ It follows that the reduction in the contractual value of its external debt is, to some extent, offset by a reduction in its capacity to make payments on that debt. It is shown below that, under fairly general conditions, the reduction in the expected value of the country's debt service payments dominates the reduction in contractual value of

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1/ See Dooley (1988) for an analysis of buy-backs financed by a third party.

2/ An exception would be the case where an unprofitable enterprise owned by the debtor government could be sold to a creditor. This would be possible if the change in ownership was expected to increase the profitability of the enterprise.

3/ If a country sells its own liability (i.e., borrows), its ability to make future payments is reduced by the additional debt service on these new liabilities. If the market discount on new debt is equal to that on old debt, the exchange of identical liabilities clearly has no effect on the initial situation. In this case, the contractual value of debt is not reduced.

remaining debt so that the market discount <u>increases</u> slightly following a self-financed buy-back. The contractual value of debt and debt service payments are, in general, reduced by self-financed buy-backs.
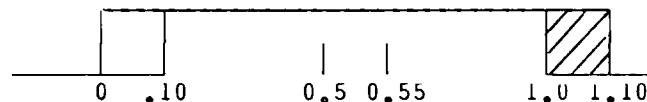
If a country <u>dedicates</u> a real or financial asset as collateral for a new class of external debt, and then offers to exchange the collateralized new debt for old debt, the impact on net debt service payments and the market discount for old debt and the net contractual value of debt will be exactly equivalent to the effects of a self-financed buy-back using the same financial or real assets. This result is derived below and is consistent with simple arbitrage conditions.

Self-financed buy backs

In order to highlight the differences between self-financed buy-backs and those financed by a third party, the effects of an unanticipated and transitory increase in the debtor country's net worth is first analyzed.

Suppose, initially, an external debt of $100 billion and that expected payments on each dollar of a country's external debt are described by the unshaded uniform probability shown in Figure 1. If the debtor received an unexpected and transitory $10 increase in its current account balance, and if the debtor invested these funds in a financial instrument that yielded the same rate as the rate at which future payments were discounted, the uniform distribution would shift to the right by $0.10 as shown in Figure 1. 1/

Figure 1

The initial price of debt was $0.50, the mean of the unshaded uniform distribution above. The shift of the distribution implies that the new market price, PM, would be:
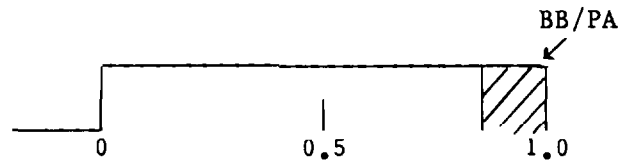
$$PM = 0.9 * (0.55) + 0.1 * 1.0 \qquad (1)$$

$$= \$0.595$$

1/ If the country could obtain a rate of return higher than the rate of which foreign investors discount expected payments, then the initial surplus of $10 billion would have a present value of more than $10 billion. This, however, seems unlikely.

The increase in the market price of debt would occur as soon as creditors learn of the unexpected current account surplus.

If the debtor then finances a buy-back by selling the financial assets bought with the unexpected current account surplus, there are two changes in the situation. First, the probability distribution for the present value of expected payments shifts back to the zero to one interval as shown in Figure 2. Second, the contractual value of the remaining debt will be reduced by the $10 billion buy-back, BB, divided by the auction price, PA, at which debt is purchased by the debtor country. The equilibrium auction price is found by setting it equal to the expected post-auction market price.

Figure 2

$$PM = 1/2(1-BB/PA) + BB/PA \qquad (2)$$

setting $PM = PA$

$$PA^2 - 1/2PA = BB/2$$

$$PA \approx 0.585$$

Thus, the $10 billion buy-back will result in about $17.1 billion in debt being repurchased and a fall in the market price of remaining debt from $.595 to $0.585. The slight fall in the market price is the opposite of what would be expected if the buy-back had been financed by a third party. The market price falls slightly in this example because in some very good states of nature (the shaded area of Figure 1) the debtor would have been able to keep the present value of the returns on reserves. Following the buy-back, the earnings on reserves will always belong to former creditors. The gross market value of the debt is reduced by about $11 billion, $59.5 billion ($100 at 0.595) to $48.5 ($82.9 at 0.585). The market value of the assets sold is only $10 billion. The "extra" billion dollar reduction in market value of debt is matched by the decrease in the expected value to the debtor of the assets sold.

The contractual value of the country's debt is reduced by $17.1 billion. If the debtor had expected to fully service this debt, that is, if it did not believe that the probability distribution shown in Figure 2

was an accurate expectation, it follows that the debtor has managed to improve its position by utilizing $10 billion of reserves to retire $17.1 billion of debt. In general, a debtor country should not hold assets which earn a risk-free rate of return when it can retire liabilities on which it is paying a risk premium that it believes inappropriate.

Collateralization

There have been a variety of proposals that would dedicate some part of a debtor country's wealth to a specific type of "new" debt instrument. The asset pledged could be a financial asset or the proceeds from a given tax, or profits of a public enterprise. In each case, it is reasonable to assume that such assets had been expected to generate a part of the payments to the initial stock of "old" debt. It follows that, as with the buy-back, two factors will act on the post-auction price of old debt. The stock of old debt will be reduced and the expected payments to old debt will also be reduced. Such a scheme might be appealing because it appears to increase the amount of old debt that can be retired as compared to a cash buy-back financed by a sale of assets. It is shown below, however, that the amount of old debt retired is the same for both types of buy-backs.

In order to collateralize new debt, the debtor dedicates some asset exclusively to its service. To keep the analysis simple, it is assumed that the $10 billion financial asset discussed above is pledged as security for $20 billion contractual value of new bonds. It is further assumed that in all other respects, new and old bonds are identical. 1/ In this case the auction would not involve an exchange of debt for cash but an exchange of old debt for new debt. Nevertheless, the equilibrium condition is determined by the expected cash prices of old and new debt following the auction. If the ratio of cash prices expected to prevail after the auction are not equal to the ratio at which contractual values of old and new debt are exchanged at the auction, there would be expected capital gains from holding one instrument or the other.

The post-auction price of old debt will again be based on the present values of expected payments over the interval zero to one (Figure 3), since the additional $10 billion earned through an unexpected current account surplus will not be available to make payments to holders of old

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1/ If the new securities were superior to old debt in other respects, their exchange value would be higher as compared to the example developed here. Subordination of old debt would, in general, increase the amount that can be retired relative to a direct buy-back. However, subordination as discussed in Dooley (1988) is equivalent to a partial default on the part of the debtor.

debt. The contractual value of old debt remaining after the auction will depend on the exchange ratio between old and new debt that prevails at the auction. We prefer to refer to the ratio between old and new debt as an "exchange ratio" rather than a "price" because this ratio does not reflect the market cash price of either type of debt before or after the auction. There is no reason, for example, to compare the exchange ratio to the market price of debt before the auction was announced. The former reflects, in part, the arbitrary relationship between the value of collateral and the face value of new debt while the latter presumably reflects market expectations about the debtors ability to pay.

The amount of old debt retired would be equal to the contractual value of new debt, BB, offered at the auction divided by the auction exchange ratio, AR, that is BB/AR. The market price of old debt following the auction will also reflect the share of new debt which is also a claim on expected payments. Since it is assumed here that new and old debt are identical in all respects other than the collateral behind new debt, the contractual value of new debt not covered by collateral is equivalent to old debt. Thus, the total contractual value of claims following the auction (per dollar of the original contractual value) would be:

$$\text{PACVN} + \text{PACVO} = 1 - (\text{BB/AR} - \text{BB} + \text{S}) \tag{3}$$

where PACVN = Post-auction contractual value of unsecured share of new debt,
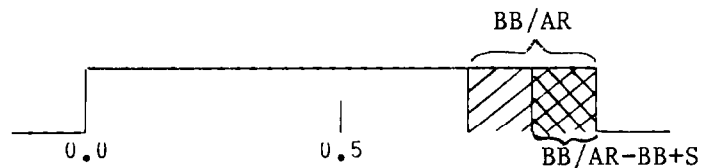
    PACVO = Post-auction contractual value of old debt,

        BB = Contractual value of new debt,

        AR = Auction exchange ratio between contractual values of old and new debt,

         S = Market value of collateral discounted at the same rate as expected payments.

Figure 3

0.0   0.5   BB/AR-BB+S

The post-auction market price of old debt would thus be

$$PO = 1/2(1-BB/AR+BB-S) + BB/AR - B + S \qquad (4)$$

The post-auction price of new debt would be

$$PN = S/BB + ((1-S)/BB) \cdot PO \qquad (5)$$

The equilibrium condition for the auction exchange ratio is that it be equal to the expected post-auction ratio of cash prices so that in equilibrium

$$AR = \frac{PO}{PN} \qquad (6)$$

By substitution

$$AR^2(1/2+1/2\ S/BB+S-1/2\ S^2/B-1/2\ B) + AR(B-S-1/2) = 1/2\ BB \qquad (7)$$

In the example set out above, $BB = 0.2$ and $S = 0.1$ so that:

$$AR \approx 0.739$$

At the auction, investors will be willing to exchange $1.00 contractual value of new debt for $0.739 contractual value of old debt. It should be noted that the discount derived here of 0.261 is not a cash market discount on either type of debt.

To find the cash price of old and new debt, the equilibrium auction exchange rate, 0.739, must be substituted into (4) and (5), respectively. This yields:

$$PO = 0.585$$

$$PN = 0.7925$$

The price of old debt is identical to that which prevailed after the straight buy-back of $10 billion discussed above. This is not surprising since the new bond is simply a composite of two securities available to any investor.

The amount of old debt retired is about $27.1 billion, an amount $10 billion greater as compared to the cash buy-back financed by the same $10 billion of assets. However, since exactly $10 billion of the new securities issued are identical to old debt, there is no net gain in this respect. In general, increasing the size of BB relative to the collateral S has no effect on the equilibrium following the auction. The auction exchange rate would depend on the contractual value of new debt issued.

For example, (7) implies that if $50 billion of new debt (backed by the same $10 billion collateral) were offered against old debt, the equilibrium exchange ratio would be about $0.876 somewhat higher as compared to the $20 billion buy-back. But the market price of old debt remaining would again be $0.585, and although $57.1 billion of debt is retired, the additional $30 billion retired is exactly matched by the $30 billion additional unsecured new debt issued. Thus, the auction exchange ratio is not a useful indicator of the value of debt or the effect of collateralization of a share of a country's external debt.

Conclusions

Buy-backs of external debt financed by sales of debtors' assets do not generate increases in market price of remaining debt. In cases where in some circumstances debtors would have been able to keep some of the earnings on assets sold to finance the buy-back, sales of those assets in a buy-back would cause declines in market prices of remaining debt. Moreover, in these cases, the market value of external debt will decline by more than the market value of the asset sold to finance the buy-back. The contractual value of the debt will fall by a larger amount, and thus the debtor benefits to the extent that it regards market discounts as based on inaccurate expectations. The use of assets to collateralize new debt is exactly equivalent to the use of those assets in a cash buy-back as long as the new securities are identical to the old securities except for the collateral.

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