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SOVEREIGN DEBT RESTRUCTURINGS:  
PANACEA OR PANGLOSS?

Jeremy Bulow

Kenneth Rogoff

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ABSTRACT

The most widely proposed LDC debt plans are flawed by their failure to recognize the fundamental differences between corporate and sovereign debt. Consequently, many plans intended to help highly-indebted countries mainly aid their foreign creditors. This paper emphasizes the crucial distinction between marginal and average sovereign debt. This distinction provides the cornerstone for an understanding of debt buybacks, debt-equity swaps, and debt-for-debt swaps involving new classes of seniority. Highly indebted countries would benefit more from direct transfers than from the same resources spent on any of these financial engineering schemes.

Jeremy Bulow  
Graduate School of Business  
Stanford University  
Stanford, CA 94305

Kenneth Rogoff  
Department of Economics  
University of Wisconsin  
1180 Observatory Drive  
Madison, WI 53706

## I. INTRODUCTION

The less-developed-country debt problem is of enormous social, political and economic significance. It is only natural that many leading thinkers from academics, government and the world financial community have tried to come up with imaginative solutions.<sup>1</sup> A number of these schemes have actually been adopted, albeit on a small scale: Highly-indebted countries (HICs) have tried trading equity in domestic firms for foreign private bank debt, repurchasing some of their foreign debt (to take advantage of secondary-market discounts), and creating new classes of senior debt. Scores of other plans, including the creation of a new multilateral lending agency to consolidate and partially forgive the debts, remain on the drawing board.

Unfortunately, all of the financial engineering gimmicks which have been put into practice, and virtually all of those proposed, fail to adequately recognize the fundamental differences between domestic corporate refinancings and sovereign debt restructurings. These differences exist because sovereign debt is supported by threats of trade and capital market sanctions instead of collateral.<sup>2</sup> Consequently, many plans that are intended to benefit debtor countries mainly help their creditors. The most pervasive problem with these schemes is that they ultimately amount to paying average sovereign debt prices to retire marginal sovereign debt. As we will show, the special limitations of sovereign debt contracts are such that the average/marginal debt problem is not easily finessed.

The difficulties endemic to financial engineering schemes can be seen in the context of recent attempts by Bolivia and Mexico to restructure their debts. Most of the paper is devoted to analyzing these examples, as well as

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<sup>1</sup>See Bergsten, Cline and Williamson (1985), and Fischer (1987) for a general discussion of the various classifications of debt schemes.

<sup>2</sup>In earlier papers, Bulow and Rogoff (1988a, b, c), we have developed a framework for analyzing sovereign debt contracts. Though our discussion here is less technical, we are in fact building very directly on that framework. Our later discussion of the institutional features of sovereign debt contracts, and in particular on the likely costs of default for a small country, also relies on the earlier work; see section 2 and the appendix to Bulow and Rogoff (1988a), and the references cited there.

debt-equity swap programs. Our main points are summarized in the conclusions.

## II. DEBT REPURCHASES

Table 1 presents recent secondary prices of government-guaranteed foreign debt for a number of HICs.<sup>3</sup> With discounts ranging from around fifty percent for Mexico, Brazil and Venezuela, to ninety percent and above for Bolivia and Peru, it is clear that investors consider these debts to be quite risky. The basic rationale underlying debt repurchase plans is that problem debtors (or their would-be benefactors) would do well to take advantage of these fire-sale secondary-market prices.<sup>4</sup>

In fact, sovereign debt repurchase plans (in their many guises) are totally misconceived. The recent Bolivian experience provides a vivid illustration of the general problem.

### A. Bolivia's March 1988 Debt Repurchase

Because of its small size, Bolivia had been considered by some to be an ideal testing ground for an imaginative debt relief plan. With encouragement from many sources, including potential donors, Bolivia negotiated with its bank creditors in early 1987 for the right to conduct a debt repurchase.<sup>5</sup> Later that year, funds were raised from an anonymous group of richer countries, rumored to include the Netherlands, Spain, and some wealthier Latin American countries. Using the benefactors' money, the

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<sup>3</sup>The fifteen countries in Table 1 are the same as the World Bank and IMF's group of "highly indebted countries," less Jamaica and Costa Rica.

<sup>4</sup>Actually, the standard contract between an LDC and its bank creditors prohibits the debtor from repurchasing its own debt. It is not entirely clear how watertight these provisions really are. For example, a country might try to circumvent them via secret third-party transactions. However, as we will later demonstrate, bank lenders should be happy to agree to waive their rights to prohibit repurchases.

<sup>5</sup>Negotiations with the banks' rescheduling committee were completed in February 1987: Creditor banks agreed to allow a one-time repurchase provided that (a) all banks were offered the same deal, and (b) each bank was given the right to reject the repurchase offer for all or part of its debt.

Table 1

FIFTEEN HIGHLY INDEBTED COUNTRIES<sup>a</sup>

<u>Country</u>	<u>Total Debt (\$US Billions)</u>	<u>Percent of Which Privately Held<sup>b</sup></u>	<u>Secondary Prices</u>	<u>Total Debt/ GNP</u>
Argentina	49.4	86	29.0	.66
Bolivia	4.6	27	10.0	1.19
Brazil	114.5	76	53.0	.41
Chile	20.5	83	60.5	1.39
Columbia	15.1	49	67.0	.47
Ecuador	9.0	70	31.0	.84
Ivory Coast	9.1	60	30.0	1.23
Mexico	105.0	86	52.5	.84
Morocco	17.3	32	50.0	1.27
Nigeria	27.0	55	28.5	.46
Peru	16.7	53	7.0	.62
Phillipines	29.0	61	52.0	.94
Uruguay	3.8	80	59.5	.63
Venezuela	33.9	99	55.0	.71
Yugoslavia	21.8	70	45.5	.33

<sup>a</sup>Secondary market bid prices for government guaranteed debt are from Salomon Brothers, May 2, 1988; all other data are from The World Bank Debt Tables. Total debt is end-1987, except for Bolivia, Costa Rica, Ecuador and Uruguay, which are end-1986.

<sup>b</sup>Non-private debt consists largely of borrowings from multilateral agencies such as the IMF and World Bank, national export-import banks, and direct government to government loans.

Bolivians spent \$34 million in March 1988 to buy back \$308 million, or forty-six percent of their \$670 million in foreign commercial bank debt.<sup>6</sup>

Was the buyback an efficient way for the donors to help Bolivia? We shall argue that most of the benefits of the repurchase accrued to Bolivia's creditors, and that Bolivia would have benefited much more from an unconditional gift. The basic problem with HIC debt repurchases is that it does not make sense to pay "average sovereign debt" prices to retire "marginal sovereign debt."<sup>7</sup> The price of average sovereign debt is the total market value of the debt divided by its face value; i.e., the secondary market price.<sup>8</sup> The price of marginal sovereign debt is the total value to creditors of having the face value of a country's debt raised by one dollar. In the case of a country like Bolivia, where average debt is worth very little, marginal debt is generally worth almost nothing. Once a country owes more than it is ever likely to repay, a small change in the face value of its obligations has little effect on rescheduling negotiations. (We will give a formal definition of average and marginal debt in Section III below.)

Consider again the results of the Bolivian debt repurchase. In September 1986, prior to any discussions of a repurchase, Bolivia's private bank debt traded at six cents on the dollar. At this price, the total market value of the \$670 million it owed banks prior to the repurchase would be \$40.2 million<sup>9</sup>. After the March 1988 debt repurchase, its \$362 million in remaining debt was selling at eleven cents on the dollar. Total market value: \$39.8 million. This calculation, which is broken down in Table 2, suggests the repurchase did very little to alleviate Bolivia's debt burden. It is possible, of course, that factors other than the repurchase caused the price of Bolivia's debt to rise. But it is worth noting that this rise took place over a period when

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<sup>6</sup>Actually, of the \$308 million in debt repurchased by the Bolivians, \$268 million was sold for cash and \$40 million was sold for local-currency bonds that can be used to invest in Bolivia.

<sup>7</sup>See Bulow and Rogoff (1988a,c). Dooley (1987) has also developed this point.

<sup>8</sup>There institutional features of the market for sovereign debt which may cause the secondary market price to deviate from the true average debt price, but these are not central to our discussion here.

<sup>9</sup>To put the size of Bolivia's debt in perspective, consider that it recently cost Donald Trump over \$400 million to purchase the eight-hundred room Plaza Hotel in New York City. In other words, the market value of Bolivia's debt amounts to less than the cost of eighty normal-size rooms.

Table 2

ANALYSIS OF BOLIVIAN DEBT BUYBACK<sup>a</sup>

	\$ Millions
(1) Value of Debt Repurchased:	
\$308 million repurchased x .06 per dollar pre-buyback price	18.5
(2) Less Increase in Value of Remaining Debt:	
\$362 million remaining debt x (.11 - .06) price increase due to buyback	(18.1)
(3) Equals Decrease in Value of Creditors' Claims	<hr/>
(1) - (2)	0.4
(4) Cost of Buyback	
\$308 million repurchased x .11 per dollar repurchase price	34.0
<hr/>	
<b>BENEFIT TO BOLIVIA AS PERCENTAGE OF TOTAL COST:</b>	
(3) ÷ (4)	1.2 percent

<sup>a</sup>Pre-buyback price is the secondary market price which prevailed in September 1986, prior to any discussions of repurchase.

the secondary market prices of all the other fourteen HICs (listed in Table 1) fell; see Table 3. Excluding Bolivia, the total market value of the HICs went down by thirty percent between September 1986 and April 1988.

If the total market value of Bolivia's debt was only \$40 million prior to the announcement of the repurchase plan, why did it cost Bolivia \$34 million to buy back less than half the face value of its debt? Creditor banks recognized that the value of Bolivia's remaining claims would go up after the repurchase; fewer creditors would remain to divide up more or less the same stream of payments (in almost all states of nature). In order to induce any creditor to tender her holdings, Bolivia had to offer the expected post-repurchase price. Of course, even had Bolivia been able to secretly buy back its debt at the old price of six cents, the repurchase would still have been extremely inefficient. As one can see from the breakdown in Table 2, it would still have cost Bolivia \$18.5 million to achieve the same benefit of only \$400,000.<sup>10</sup>

While the buyback was basically a giveaway from Bolivia and its benefactors to the banks, these benefactors were not necessarily "duped". For example, the transaction could have been part of a larger secret deal in which the IMF and other international agencies agreed to give Bolivia increased financial aid only if the Bolivians executed the buyback. However, even if this is true, the repurchase itself still represents a \$34 million gift to the banks.

#### B. Rescheduling Versus Repudiation, and the Distinction Between Average and Marginal Sovereign Debt

In theory, there is one special case where marginal and average sovereign debt have the same value. They are equal if debts are only paid in full or not at all. It may be that this case, emphasized in the early theoretical literature on sovereign debt contracts, has motivated advocates of debt repurchase plans. However, both the recent theory of sovereign debt contracts, and the extensive historical evidence<sup>11</sup> suggest that "rescheduling" (negotiated partial default) is much more likely to occur than outright repudiation. The rationale for rescheduling is simple: the main cost to a country of repudiation is that it will suffer reduced access to world goods and

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<sup>10</sup>A secret debt repurchase might benefit a country which had extremely favorable private information about its future economic prospects.

<sup>11</sup>See, for example, Borchard and Wynne (1951), and Winkler (1933).

Table 3

## SECONDARY MARKET BID PRICES OF FIFTEEN HIGHLY INDEBTED COUNTRIES

<u>Country</u>	<u>8/18/86</u>	<u>2/20/87</u>	<u>7/13/87</u>	<u>4/4/88</u>
Argentina	66.5	65.0	47.0	28.0
<b>BOLIVIA</b>	<b>6.0</b>	<b>9.0</b>	<b>10.0</b>	<b>11.0</b>
Brazil	74.0	69.0	57.0	49.5
Chile	66.0	68.0	68.0	58.0
Columbia	84.0	86.0	81.0	65.0
Ecuador	65.0	64.0	45.0	31.5
Ivory Coast	75.0	77.0	60.0	30.0
Mexico	57.0	57.0	54.0	51.0
Morocco	70.0	69.0	65.5	50.0
Nigeria	50.0	36.0	28.0	28.5
Peru	20.0	18.0	11.0	6.0
Phillipines	66.0	70.5	68.0	51.0
Uruguay	63.0	71.0	70.0	59.5
Venezuela	74.0	75.0	69.0	54.2
Yugoslavia	79.0	78.0	73.0	46.5

Source: Salomon Brothers, Inc.

capital markets.<sup>12</sup> However, creditors do not gain directly by such a cutoff and, in some states of nature, this leaves the debtor scope to bargain for lower repayments.<sup>13</sup> This possibility is, of course, factored into the risk premium the sovereign must offer.

### III. CONTRASTING THE CALCULUS OF CORPORATE VERSUS SOVEREIGN DEBT REPURCHASES

The unprofitability of debt repurchases for sovereign governments requires further explanation. After all, in corporate indentures, borrowers are often prohibited from making debt repurchases at discount. Presumably these indentures, which have been copied into international debt contracts, are included to benefit lenders. This implies that repurchases are generally advantageous to borrowers. As we will now demonstrate, this apparent puzzle can be explained by examining the fundamental differences in the bargaining factors underlying sovereign versus corporate debt rescheduling negotiations.

#### A. The Corporate Case

Corporate bondholders will typically require several covenants to protect their claims. Such restrictions may include the familiar limitations on dividends and share repurchases, clauses limiting the use of funds for risky investments, and limitations of open market repurchase of debt at a discount from face value.

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<sup>12</sup>Consider the recent example of Brazil, which in 1987 temporarily declared a unilateral debt moratorium. Many banks responded by cutting back on short-term credit lines for imports and exports, while others substantially increased their charges. Brazil was afraid to hold reserves for fear that creditors would be able to seize the money to offset loans. Also, the governments of creditor nations, and agencies such as the World Bank and the International Monetary Fund, came under political pressure to refuse Brazil financial help during the moratorium. Consequently, Brazil was forced to make net repayments on its loans from foreign governments and multilateral lending agencies. (See the New York Times, February 1988).

<sup>13</sup>Willingness to pay and not ability to pay is clearly the binding constraint for all the HICs in Table 1. Even counting debt from official sources, much of which is implicitly highly concessional, few HICs owe even a year's GNP. This is an amount which most countries could pay off eventually, were their leaders and populace sufficiently determined to do so.

Why have discount repurchase restrictions? Because even in a full information world such repurchases hurt bondholders. Consider a corporate borrower with  $\$C$  in cash and some physical assets. The physical assets will return  $\tilde{P}$  tomorrow, where  $\tilde{P}$  is a random variable with a non-negative value. Bondholders have a claim of  $B > C$  due as soon as  $\tilde{P}$  is realized. Then if debt repurchases are prohibited, bondholders will receive payments of  $\Pi$  where

$$\Pi = \min(C + \tilde{P}, B) = C + \min(\tilde{P}, B - C) \quad (1)$$

That is, bondholders essentially own the cash in the firm and the first  $B - C$  dollars yielded by the physical assets. Of course, if there is a chance that  $\tilde{P}$  will be less than  $B - C$ , then the bonds will sell in the market for less than the face value.<sup>14</sup>

Now assume that the firm is allowed to spend its cash to buy back a portion of its bond issue. Because the bonds are selling discount,  $\$C$  of cash may be used to buy back  $\$R$  face value of bonds, where  $B > R > C$ .

After the repurchase, the company's balance sheet shows physical assets that will return  $\tilde{P}$ , and a bond debt which will pay  $\Pi'$  where

$$\Pi' = \min(\tilde{P}, B - R) \quad (2)$$

Aggregating the bondholders whose debt was repurchased together with the remaining bondholders, we see that bondholders must lose from the repurchase. Prior to the repurchase, their claim was to all the corporate cash plus the first  $B - C$  dollars of return from the risky asset. After the repurchase, they have the cash plus a claim to only the first  $B - R$  dollars of return.

Essentially, the repurchase operation can be broken into two parts. First the corporation announces to bondholders that it will issue  $\$C$  of new bonds in exchange for  $\$R$  of old bonds, with the new bonds having priority over any remaining debt. Second, it redeems the new bonds for cash.

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<sup>14</sup>If the bonds are coming due in the future the analysis is identical, but all the variables here must be interpreted as present values, discounted at the riskless rate.

Because all bonds were originally equal priority, it is clear that in the first step, the corporation usurped part of the bondholders' claim. Essentially, the company is claiming the right to make some of the bondholders senior, and to auction off that right. Since creditors as a whole are always paid ahead of stockholders, the company is simply forcing the bondholders to bid against each other for seniority rights they already hold. So there is good reason for a corporation's creditors to prohibit this kind of activity.

#### B. The Sovereign Case

The sovereign debt is entirely different. The amount of money that a Brazil, a Mexico, or a Bolivia pays each year is only ambiguously related to its holdings of foreign reserves. On one hand, extra reserves may strengthen a country's ability to pay cash in advance for many imports and thus lessens its dependence on the banks. On the other, lower reserves may make the country's insistence on lower repayments more credible under the "you can't squeeze blood from a stone" theory. Because reserves have little impact on debt repayments, creditors only gain when sovereign debtors engage in voluntary debt repurchases.

Thus consider a country with an outstanding debt of face value  $D$  and market value  $v(D) = E\{\min(D, \theta)\}$  where  $\theta$  is a random variable. We assume that the probability that all debt will be repaid is  $F(D)$ , where  $1 > F(D)$  so there is some possibility of default. Note that an increase of one dollar in the face value of total debt increases the market value by  $F(D)$ , so  $v'(D) = F(D)$ . We call  $v'(D)$  the value of marginal debt. Because there is some possibility that debt will only be partially repaid and the market assigns positive value to the repayments made in that circumstance, the market price of a dollar of debt,  $v(D)/D$ , exceeds the probability of full repayment. We call  $v(D)/D$  the "average value" of debt. Therefore, the "average value" of debt exceeds the "marginal value."

Suppose that the country spends  $\$C$  to repurchase part of its debt. As we discussed in our post-mortem of the Bolivian deal, the country must offer a high enough price so that creditors who sell will be at least as well off as those who do not sell. Thus, in equilibrium  $\$C$  in cash can be exchanged for  $\$X$  in bonds, where

$$\frac{C}{X} = \frac{v(D - X)}{D - X} \quad (3)$$

Tendering bondholders are being repaid at a price of  $C/X$  per dollar of debt exchanged. They must be indifferent between selling, and being one of the remaining  $D - X$  bondholders, who are left splitting a claim of  $v(D - X)$ .

However, because marginal debt is worth less than average debt we have

$$\frac{v(D - X)}{D - X} > \frac{v(D)}{D} \quad (4)$$

That is, repurchases push up the price of remaining debt. Because (a) the repurchase is a purely financial transaction with no efficiency gains or losses and (b) the repurchase makes the bondholders better off, then the country must come out behind. This contrasts with the corporate case where the use of cash for a repurchase diminishes the creditors' security and causes bond prices to drop.

We have not taken into account the possible risk-sharing features of sovereign debt contracts, but these would usually serve to make the transaction less appealing. When the face value of the country's debt is reduced, it benefits only in very good states of nature when its output and gains from trade are high, and where creditors have enough bargaining power to enforce full repayment. In bad states of nature, the country gains nothing: it pays no less than it would if the face value of its debt were higher.<sup>15</sup>

Finally, we show in the Appendix that even if cash reserves do increase creditors' expected future repayments, it is implausible that the relationship is strong enough to make repurchases profitable.

It seems that for countries with tens of billions of dollars of debts more than anyone expects them to repay, spending money on debt repurchases is like throwing yen after pesos. Debt repurchases are inferior to the standard vehicle of rescheduling negotiations, where the debtor is better able to negotiate with creditors as group. When creditors bargain in concert, they can

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<sup>15</sup>We are implicitly assuming that country is more risk averse than its international lenders. Presumably, international investors can diversity against the country's productive uncertainty in world capital markets.

internalize the fact that a decrease in one creditor's holdings benefits the country's remaining creditors.

Of course, if Bolivia's benefactors could have found a way to wipe out the country's entire debt for just \$40 million (the total market value), there would have been no leakage of benefits to creditors.<sup>16</sup> In principle, the country could negotiate such a comprehensive deal in the same manner that rescheduling agreements are negotiated. One of the biggest obstacles is probably the jockeying by creditors for a share of third-party sidepayments.<sup>17</sup> Also, while third-parties may be willing to sponsor complete debt writeoffs for the smallest, poorest debtors, there is probably no group willing to buy back (and forgive) the entire debt of a large debtor such as Mexico or Brazil.<sup>18</sup>

#### IV. DEBT-EQUITY SWAPS

While debt repurchases have not been large, their close cousins, debt-equity swaps, have been widely publicized and have received active support from the banks. In a debt-equity swap, a country agrees to exchange local currency for bank debt, with the stipulation that the currency be used for local investment. The terms of the exchange are typically negotiated as part of a rescheduling package. In most cases, the original creditor banks are not required to make the swaps themselves; they are allowed to sell their debt in the secondary market to a foreign company which actually swaps the debt and makes the investment.

Debt-equity programs have already been initiated in a number of HICs, including Brazil, Chile, Costa Rica, Ecuador, Mexico, the Philippines and

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<sup>16</sup>It would be more accurate to say that if benefactors had retired Bolivia's debt for \$40 million, there would have been less leakage to creditors. The secondary market price of Bolivian debt presumably incorporate expectations about future third-party sidepayments.

<sup>17</sup>Debtors and creditors can exploit the threat of repudiation to try to extract a flow of sidepayments from interested third parties, such as creditor-country taxpayers who would be hurt by trade disruptions; see Bulow and Rogoff (1988c).

<sup>18</sup>Of course, in the cosmos of world capital markets, the debts of HICs are not all that large. Consider that as of May 1988, the total market value of the private debts of the fifteen countries in Table 1 was just fifty-six percent of the market value of the common stock of Nippon Telephone and Telegraph Company.

Venezuela.<sup>19</sup> Though growing, the scale of these programs has thus far been limited. During the period 1984 through September 1987, the aforementioned countries converted roughly six billion dollars in bank debt into equity, or three percent of the group's total bank debt. (Chile has had the largest program to date; it has used debt-equity swaps to retire over thirteen percent of its foreign bank debts.)

Much of the controversy surrounding debt-equity stems from concern that debtor countries appear to be paying well above secondary-market prices to repurchase their debt. For example, in early 1988, Brazil was swapping 73 cents worth of cruzados for each dollar face amount of debt. Since the debt has a market value of 50 cents, the country appears to be leaving 23 cents "on the table." But this concern is misplaced: the debtor has a number of ways to recapture at least part of the surplus. First of all, the deals do not seem so bad when local currency prices paid for the bank debts are converted to dollars at black market exchange rates instead of official exchange rates. Second and equally important, the new equity investors have no guarantee that they will ultimately be allowed to repatriate earnings. The new investment is subject to some of the same political default risk as the original bank debt which sold at discount.<sup>20</sup>

The above considerations would seem to make it very difficult to evaluate the welfare effects of debt-equity swaps. However, our earlier analysis of debt repurchases suggests a very simple and powerful argument that HICs will not benefit from undertaking debt-equity swaps, unless their creditors compensate them for doing so. Table 4 shows how any debt-equity swap can be broken into two components. First, a company buys some of a country's bank debt on the secondary market. Second, it takes the debt and

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<sup>19</sup>See "Global Debt: The Equity Solution," supplement to Euromoney and Corporate Finance (January 1988), and Regling (1988).

<sup>20</sup>Short of nationalization, the debtor can easily appropriate investors' earnings through taxation, through laws which require firms to pay high wages, by charging discriminatory fees for providing power or telecommunications, or simply by prohibiting the firm from obtaining foreign exchange. In addition to these implicit risks, there are often important explicit restrictions on equity obtained via debt-equity swaps. For example, the investor is usually explicitly prohibited from repatriating any earnings for an extended period. Also, the investor is often required to invest in certain industries or certain parts of the country; see Kling (1988).

Table 4

ANALYSIS OF DEBT-EQUITY SWAPS

<u>Debt-Equity Swaps</u>	<u>Equivalent Transactions</u>
(a) Company spends \$E to purchase bonds at "average debt" prices	(c) Company pays country \$E cash for \$E assets
+	+
(b) Bonds are swapped for \$E of physical assets in debtor country	(d) Country spends \$E cash to repurchase debt at "average debt" prices

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OUTCOME OF (a) + (b) OR (c) + (d)

Investors: Receive \$E physical assets; pay \$E cash.

Banks: Receive \$E cash; value of claims reduced by  
 $\$E \times (\text{Marg. Value of Debt} / \text{Avg. Value of Debt})$

Country: Trades \$E of physical assets to reduce value of debt claims by  
 $\$E \times (\text{Marg. Value of Debt} / \text{Avg. Value of Debt})$

**CONCLUSION:** A debt/equity swap is simply the sum of a conventional direct foreign investment and a purchase of marginal debt at average debt prices. The second transaction is unprofitable for the country. Therefore, conventional direct foreign investment [transaction (c)] dominates debt/equity swaps.

trades it for physical assets in the country. This combination of transactions is exactly equivalent to the following two transactions: First, the country sells assets to the company for cash through a conventional program of direct foreign investment. Second, the country uses the money to retire marginal debt at the average debt prices.<sup>21</sup> The second transaction is definitely unattractive for the debtor. And it does not need to undertake the second transaction to undertake the first.<sup>22</sup>

Obviously, it is all right for countries to agree to undertake debt-equity swaps if they get something equivalent in return; e.g., an increase in "new money" loans.

#### V. FINANCIAL ENGINEERING GIMMICKS TO FINESSE THE MARGINAL-AVERAGE DEBT PROBLEM

Are there any financial engineering tricks that a country can use to retire marginal debt at marginal debt prices? Here we show that the answer would be yes, were it only possible to enrich the seniority structure of the debtor's obligations. The much publicized recent (February 1988) Mexican debt plan provides a good example for illustrating the general issues.

Mexico's plan was to issue \$10 billion in new bonds, and then auction off the bonds for bank debt. The bonds were to be partially collateralized by U.S. Treasury bonds, which Mexico would purchase out of its own reserves. Also, Mexico implied that the new bonds would be treated as senior to existing bank debt. It might seem that the banks would have refused to authorize such a deal, but this is not necessarily the case. Because the new bonds were financed in part by Mexican reserves, the plan really constituted an amalgam of a debt repurchase for cash, which helps bank creditors, and an expropriation of seniority rights, which hurts them. Before evaluating the outcome of the Mexican deal, we first consider the economics of this type of exchange:

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<sup>21</sup>Both the country and the company will pay the same secondary market price, provided that when the company is the buyer, investors anticipate that the debt will be retired via a debt-equity swap.

<sup>22</sup>Others have queried debt-equity swaps on macroeconomic and public finance grounds; see for example, Watson *et al* (1988). We think the finance-theoretic argument presented here provides the most compelling objection to swaps.

A. Creating a New Class of Senior Debt: The Analytics

Assume that a country has a debt with face value of  $D$  and market value of  $v(D)$ . It wishes to exchange some cash  $C$  and some new first priority bonds with face value  $N$  for old bonds with a face value of  $X$ . On net, the country's debt will be reduced by  $X - N$ . Assuming that the country is unwilling to pay more than marginal debt prices to extinguish its obligations, and that creditors will agree to any scheme so long as they "come out whole," what set of transactions is available to the country?

First, if bondholders who exchange their debt are to break even, then:

$$\frac{C + v(N)}{X} = \frac{v(D)}{D} \quad (5)$$

That is, the bondholders who participate in the exchange will give up  $X$  bonds for cash worth  $C$  and first priority bonds worth  $v(N)$ . The value they receive per bond must be equal to the pre-exchange bond price of  $v(D)/D$ .

Second, bondholders who do not exchange their debt must also break even:

$$\frac{v(D + N - X) - v(N)}{D - X} = \frac{v(D)}{D} \quad (6)$$

The left hand side of (6) represents the total value of the junior bondholders' claims after the exchange, divided by the number of junior (unexchanged) bonds.

If the value of marginal debt,  $v'$ , is strictly decreasing, then choosing any one of  $C$ ,  $N$ , and  $X$  uniquely determines the other two. But even if not, there is a unique relation between  $C$  and the amount of debt extinguished  $X - N$ :

$$C = v(D) - v(D + N - X) \quad (7)$$

Equation (7) confirms that because all bondholders are coming out exactly even, the country is managing to pay exactly the marginal value of debt in its repurchase.

However, there is a limit to how large a repurchase can be executed in this fashion. It is easy to show in solving (5) and (6) that  $d(X - N)/dX \geq 0$  for  $X \leq D$ . That is, the greater the number of bondholders that are induced to exchange their debt the larger the net retirement of debt. Thus, the largest

possible net reduction will occur with an offer where  $X = D$ ; that is, when all bondholders will opt to exchange.

Taking the limit of equation (6) as  $X \rightarrow D$  yields

$$v'(N) = \frac{v(D)}{D} \quad (8)$$

That is, the largest feasible voluntary exchange offer will reduce debt by just enough so that the post-exchange value of marginal debt equals the pre-exchange value of average debt. Larger such exchanges are possible only if the country is willing to pay more than the reduction of the market value of its debt.

#### B. The Mexican Experience

So much for the theory. How did the Mexican debt exchange actually work?

The \$10 billion in new bonds offered by Mexico were intended to be preferable to existing bank debt in three respects: First, the principal on the bonds, to be repaid in the year 2008, was fully collateralized by specially-issued zero-coupon U.S. Treasury bonds. Since the present value of the principal payment amounts to roughly twenty percent of the face value of the new bonds, the bonds are effectively twenty percent guaranteed by the United States and eighty percent guaranteed by Mexico. Second, the new bonds were given implicit seniority over Mexico's other outstanding debt, with the Mexicans promising to make the bonds exempt from future rescheduling agreements.<sup>23</sup> Third, the bonds carried an interest rate of LIBOR (London Interbank Offer Rate) plus 13/8 percent, or twice the accounting spread on Mexico's bank debt.

To sell the new bonds, the Mexicans used a discriminatory auction (like a treasury bill auction), in which bidders made offers specifying how much

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<sup>23</sup>Technically, the bonds were to be exempted from "new money" requirements in future reschedulings. In the jargon of rescheduling agreements, "new money" are interest payments which the lenders agree to roll over. Thus when one sees a newspaper headline stating "Mexico receives \$3 billion in new money," it may well mean that lenders succeeded in getting Mexico to pay \$1 billion dollars out of \$4 billion it owed.

new bond debt they wished to purchase, and how much of the old bank debt they were willing to pay. Mexico had hoped to be able to trade the \$10 billion in new bonds for \$20 billion in bank debt. If fully successful, the offering would have eliminated roughly \$11 billion in debt at a cost of \$2 billion in reserves, or eighteen cents on the dollar.<sup>24</sup>

Investors greeted the new bonds skeptically. Less than twenty percent of eligible creditors participated in the exchange, and those that did often exchanged only a small fraction of their outstanding debt. As Table 5 shows, the Mexicans managed to reduce their debt by only \$1.44 billion at a cost in reserves of \$532 million, implying a repurchase price of 37 cents on the dollar.<sup>25</sup> Relative to the goal of retiring \$11 billion in debt at eighteen cents on the dollar, the Mexicans achieved just thirteen percent of their debt reduction goal at twice the desired price.

Why did the deal flop? A key reason is that investors seemed to doubt the seniority provisions. Advocates of the plan argued that both law and custom would give the new bondholders implicit seniority over remaining bank claimants, and pointed to the fact that throughout the entire debt crisis Latin American bonds have been punctually serviced.<sup>26</sup> However, although Mexico has indeed serviced its Eurobond issue of less than two billion dollars outstanding throughout the debt crisis, the 17.5 percent yield to maturity on those bonds indicates that the market does not regard Mexico's commitment to payment without rescheduling as absolute. Moreover, whereas the small-potato Eurobond issue holders have not yet been brought into rescheduling, one suspects that this situation would change if the amount of bonds grew substantially. As shown in Table 5, the component of the new bonds issued and guaranteed by Mexico sold for approximately fifty-five percent as much as riskless bonds.

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<sup>24</sup>The \$2 billion is the cost to Mexico of collateralizing the principal payment. The \$11 billion figure represents the difference between the \$8 billion of the new bonds that would have been guaranteed by Mexico, adjusted upwards for their higher interest rate, and the \$20 billion of loans to be exchanged.

<sup>25</sup>While 37 cents is below the secondary market prices, claims that the Mexican plan would be a major breakthrough in the debt crisis were clearly overblown.

<sup>26</sup>See, for example, Cline (1987), or Sachs "Mexico Plan a Model for Other Debtors," Wall Street Journal, January 12, 1988.

Table 5

## THE MEXICAN DEBT DEAL

(amounts in billions of dollars)

(1) Loans Retired Through Swap	3.67
Less:	
(2) Newly Issued Bonds	2.56
(3) – Portion Guaranteed by United States Securities	(.53)
(4) + Adjustment for Increased Interest Rate on Bonds	<u>.20</u>
	(2.23)
Equals:	<u>1.44</u>
(5) Reduction in Mexican-Guaranteed Debt	1.44
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(6) Expenditure of Reserves for U.S. Securities	.53
(7) EXPENDITURE PER DOLLAR OF DEBT REDUCTION = (6) + (5)	<u>.37</u>
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(8) Market Value of Retired Debt .52 secondary price x 3.67 debt retired	1.87
(9) Value of New Mexican-Guaranteed Component = (8) – (3)	1.34
(10) Value of Mexican Component Discounted at Riskless Rate (LIBOR)	2.43
(11) PRICE OF MEXICAN COMPONENT AS FRACTION OF RISKLESS PRICE = (9) + (10)	<u>.55</u>

The analysis in section V.A assumed that it is possible to issue new bonds that have absolute priority over the old. If it is impossible to make some creditors senior, no such deal can be done. Furthermore, we showed that the maximum debt reduction (without the country overpaying) is achieved in a swap where all bondholders exchange their debt and, on the margin, any bondholder who did not exchange would become the lone junior claimant with a credit worth  $v(D)/D$ . Essentially, the same result can be derived when only limited seniority exists. However, without absolute seniority a junior creditor will get a higher payoff for any given amount of debt left outstanding. Therefore, if the value of a junior creditor's claim is to be no more than  $v(D)/D$ , then less debt can be retired than with absolute seniority.

### C. Seniority Clauses in Private International Lending Contracts

Many of the most widely-discussed debt plans explicitly or implicitly rely on creating a new class of senior debt, as in the Mexican plan.<sup>27</sup> Yet the general issue of seniority in international debt contracts is not well understood by economists. Unlike the case of corporate debt, where one observes a rich variety of seniority structures, most sovereign debt obligations receive nearly identical treatment. The standard sovereign debt contract contains a pari pasu or "equal-sharing" provision which prohibits the country from issuing new debt senior to existing debt.<sup>28</sup> This is not only true today, but historically as well.<sup>29</sup> Although we do not fully understand the seniority clause in international debt contracts, an exploration of the bargaining factors

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<sup>27</sup>Sachs (1987) and Cline (1987) explicitly recognize the importance of senior debt to their debt plans. As we discuss below, plans for creating an international debt facility also seem to require the creation of a class of senior debt.

<sup>28</sup>For a more complete discussion of pari pasu clauses, see Bulow and Rogoff (1988a).

<sup>29</sup>See Borchard and Wynne (1951), and Winkler (1933). However, as Eichengreen and Portes (1988) point out, in the 1930s countries were able to discriminate in favor of national loans over state and local obligations. One does observe very small classes of senior debt; foreign loans to national airlines are often collateralized by aircraft. Most of the debt plans involve creating senior debt on a much larger scale.

underlying sovereign debt contracts may be able to give some important insights.

In the case of corporate debt, senior creditors ultimately have the threat of liquidating the firm and claiming first rights to the proceeds. This protects them from being asked to make concessions in rescheduling negotiations. In the international context, senior creditors have no similar option. As we have already emphasized, the most any foreign creditor can threaten to do in the event of non-repayment is to interfere with the country's trade in international goods markets and capital markets, and to lobby their home governments for further assistance. Suppose first that junior creditors are allowed to employ the same sanctions as senior creditors. Then, if "senior" creditors are ever being paid more than "junior" creditors, the junior creditors can threaten to invoke sanctions. Once the sanctions are invoked, the debtor country might just as well stop payments on the senior debt. Hence senior creditors would not really have any bargaining advantage over junior creditors. At the opposite extreme, suppose junior creditors have no legal or political rights to impose sanctions. Then the country will pay nothing on junior loans and they will be worthless. While it may be theoretically possible to create a sizable quantity of senior debt without stripping junior loans of their rights entirely, such contracts have not yet become prominent in international markets.

Clearly, the market felt that Mexico's pledge to give its new bonds implicit seniority made them worth a little more, but not much more, than Mexican bank debt. Given that so few bonds were actually issued, the bonds may well be ignored in future reschedulings and thus turn out to be a good deal for their buyers. But if bonds ever become a significant fraction of outstanding debts, then there will be great pressure from the country and the banks to push the bondholders into renegotiations. During the last great wave of reschedulings in the 1930's, virtually all sovereign debt was bond debt and this certainly did not prevent countries from negotiating rescheduling agreements.<sup>30</sup>

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<sup>30</sup>The negotiations between debtors and foreign bondholders' committees were similar in many respects to today's rescheduling negotiations. See Borchard and Wynne (1951), *op cit.*

#### D. The Efficacy of the Mexican-Style Debt Plans

If new bonds cannot be made senior, then a plan such as the Mexican exchange simply reduces to a combination of two transactions: (a) a meaningless swap of old Mexican-guaranteed paper for identical new Mexican-guaranteed paper, and (b) an additional swap of some old Mexican paper for cash. The effect for Mexico is exactly the same as if it used its reserves to make a straight debt repurchase. That is, it is something they can benefit from only if their creditors adequately compensate them for doing it.

But what if there were some way to create a large class of senior bond debt? Would a Mexican-style exchange benefit the debtor? Probably not. In fact, the creation of a new class of lenders might easily lead to greater inefficiencies in the rescheduling process, by adding to the number of disparate parties involved. The bottom line is that swaps of bank loans for securities do nothing if the securities cannot be made senior in some way. And if there is a way to make the securities senior, then Mexican-style swaps might be worse than doing nothing.

#### VI. DEBT FORGIVENESS PLANS

We have used the Bolivian debt repurchase, the Mexican debt plan, and debt-equity swaps to illustrate the general problem of finding ways to retire marginal sovereign debt without making large transfers to lenders. This problem is not special to these plans, but is endemic to virtually all the scores of (yet untested) debt relief plans proposed since 1982.

Obviously, if creditor-country governments can coerce their banks into participating in a debt relief plan, then the banks can be forced to accept marginal debt prices (or less, for that matter). There are many reasons why mandatory debt forgiveness plans are non-starters. For one thing, it is unclear whether such plans would stand up in court. Also, LDCs are not the most politically powerful of the banks' debtors, and it is hard to see how they could succeed in obtaining mandatory debt relief ahead of problem debtors residing in the creditor countries.

A significant obstacle to all debt relief plans, but especially those that involve coercion, is the need to coordinate the actions of the different creditor-country governments. U.S. commercial banks hold less than forty

percent of Latin America's private bank debt.<sup>31</sup> If the U.S. were to unilaterally force its banks to forgive half of their holdings of say, Mexico's debt, the benefits to Mexico would be second order (because marginal debt doesn't mean much). However, U.S. banks might suffer a significant drop in their share of Mexico's repayments. Indeed, European and Japanese banks could end up being the primary beneficiaries of any unilateral U.S. debt relief plan. For mandatory forgiveness schemes to work to the benefit of the debtors, they must involve coordinated action among the creditor-country governments. Because banks can stall deals through the courts, the prospects for such concerted action are remote.<sup>32</sup>

Many plans involve the creation of a new multilateral lending institution like the IMF or the World Bank; Kenen (1983) terms the institution the International Debt Discount Corporation (IDDC). The IDDC would buy up some of the HIC's bank debts and partially forgive them.<sup>33</sup> The institution would be financed, directly and through implicit insurance guarantees, by creditor-country taxpayers. Unless banks are forced to sell their debt to the new institutions, an IDDC would face exactly the same problem as Bolivia's benefactors faced in their efforts to retire part of its debt. As discussed in the analysis of Mexico's debt deal, this problem could be ameliorated if IDDC debt could be made senior to bank loans. Whether this can be achieved is questionable. Advocates of an IDDC argue that such an agency's debt would effectively be senior, claiming that debtor countries already give priority to repaying their International Monetary Fund and World Bank loans. However, whereas international lenders nominally get priority, they continually ante up a disproportionate share of "new money" lending to debtors. Most IDDC plans assume that money owed to an official creditor will be paid back like clockwork, whereas loans from a private bank

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<sup>31</sup>See Watson et al (1988) and Feldstein et al (1987).

<sup>32</sup>Africa might be an exception, since there banks' legal and lobbying fees may outweigh any repayments they can hope to get.

<sup>33</sup>Felix G. Rohatyn, "A Plan for Stretching Out Global Debt," Business Week, February 28, 1982; Peter B. Kenen, "Third World Debt: Sharing the Burden, A Bailout Plan for the Banks," New York Times, March 6, 1983; Weinhert, Richard S., "Swapping Third-World Debt," Foreign Policy, Winter 1987. Recently, a variant of these plans has been advocated by U.S. Congressman John LaFalce; this plan is being actively considered in House subcommittee hearings (See Hobart Rowan, Washington Post, April 7, 1988).

such as Citicorp are much less likely to be repaid. In fact, it seems much more likely that once the debt is in official hands there will be strong political pressures for further substantial writeoffs.

As Table 6 illustrates, private creditors have driven much harder bargains than have official creditors throughout the debt crisis. Official creditors, including individual governments and multilateral institutions, have provided the HICs with considerably more "new money" than they have received in interest and principal repayments. Private creditors, on the other hand, have succeeded in collecting roughly \$12 billion per year more than they have provided in "new money".

By contrast, if the advocates of these plans are right and the official loans would be religiously repaid, then the implementation of such a plan may be costly to debtors. For example, if the Kenen plan had been adopted when proposed it would have required Argentina to pay \$8 billion more over the last five years to the IDDC than it has paid to bank lenders.

## VII. MORAL HAZARD AND INVESTMENT

One popular argument in favor of debt reduction schemes is that the debt overhang inhibits growth in the debtor countries. Basically, debtors know that their creditors will be able to make them pay more if their output grows. Thus the debt overhang works like a tax on investment. In theory, the distortion can be so large that both creditors and debtors could be made better off if part of the debt is forgiven.<sup>34</sup> Proponents of the view that there is a "Laffer Curve" in international debt point to the sharp drop in debtor-country investment over the six years of the debt crisis.

Our main points in this paper do not turn on whether or not there is Lafferitis in international debt, but we wish to register our skepticism anyway. First of all, there is already constant negotiating between the creditors' committees and the debtor countries over economic policies, current repayments, and the level of outstanding debt (determined through interest rate negotiations). This system of constant recontracting gives the parties involved considerable latitude to make agreements. It seems unlikely that

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<sup>34</sup>This theoretical possibility was pointed out by Atkeson in 1986 (1988 Stanford Business School Ph.D. thesis), and has been argued as important by Sachs and Huizinga (1987).

Table 6

CAPITAL FLOWS FROM HICS BY TYPE OF CREDITOR  
1983-86

(Billions of Dollars)

	Official		Private
	Multilateral	Bilateral	
(1) Interest Payments	9,535	6,495	78,059
+ (2) <u>Principle Repayments</u>	<u>9,496</u>	<u>10,652</u>	<u>32,586</u>
= (3) Total Payments	19,031	17,148	110,645
- (4) "New Money" Loans	(26,374)	(15,933)	(62,800)
= (5) Net Flows from HICs	(7,343)	1,215	47,845
(6) "NEW MONEY" AS PERCENTAGE OF REPAYMENTS = (4) ÷ (3)	139%	93%	57%

Source: World Bank Debt Tables, 1987-88.

after six years of negotiating, tens of billions of dollars in easily-achieved efficiency gains have been left on the bargaining table. The argument that efficient debt relief schemes will be blocked because they may involve small losses to the banks is also wrong. If there are any efficiency gains to be had via debt forgiveness, then it is possible to design a simple scheme which lets banks capture all the rents.

As for the low growth rates in the highly-indebted countries, these are likely attributable to the same factors which set off the debt crisis: adverse terms of trade shocks, high world interest rates, and low growth rates in the industrialized world.<sup>35</sup> When real interest rates rise and copper prices fall, investment in copper mines becomes less attractive. The political climate for investment is no doubt also a major problem.<sup>36</sup> All in all, it is not obvious that rates of return on investment are higher in South America than in Asia<sup>37</sup> where countries are not generally experiencing severe problems with debt service. We view the debt crisis principally as a byproduct and not a cause of Latin America's growth problem.

#### VIII. CONCLUSIONS

We have shown that sovereign debt restructurings are fundamentally different from corporate financings. They are different because a corporation's bondholders have first claim to its cash reserves, whereas a sovereign's creditors' bargaining power depends primarily on other factors, such as the country's gains from trade and the value of having access to world capital markets. Our analysis casts serious doubt on recent plans for highly-indebted countries to repurchase their debts at secondary-market discounts, and to engage in debt-equity swaps. Both schemes amount to the repurchase of marginal sovereign debt at average sovereign debt prices. If it were possible to design a mechanism for creating senior debt, then a carefully-crafted deal could lead to a repurchase of a limited amount of marginal debt at marginal debt prices. However, it is difficult both in theory and in practice to credibly guarantee that any large class of debt will be treated as senior in international

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<sup>35</sup>See Dornbusch (1987).

<sup>36</sup>It was not easy for a country such as Argentina, with its enormous wealth of physical and intellectual resources, to go from having one of the world's highest per-capita GNPs before World War I to where it is today.

<sup>37</sup>Or Wisconsin, for that matter.

debt rescheduling negotiations. The less absolute the seniority of the newly-issued bonds, the less scope there is for achieving debt reduction through such deals. This issue was shown to have created problems for Mexico's February 1988 swap.

We argue further that these same basic problems are endemic to virtually all of the dozens of (creditor-country taxpayer-sponsored) debt forgiveness schemes which have been proposed.

Does our analysis suggest a better debt plan? First of all, the current regime of "constant recontracting" among debtors and creditors may not be so inefficient, when one takes into account the special constraints on sovereign debt contracts. Many of the perceived inefficiencies in the current rescheduling process probably stem from the jockeying of debtors and banks for creditor-country support. But our main conclusions are as follows: First, if outside parties wish to spend money to help the highly indebted countries, and not their creditors, then no "financial engineering" scheme will be as effective as a direct cash grant. Both the theory of sovereign debt contracts and historical experience suggest that very little of the benefits of such cash transfers would accrue to creditors. In contrast, virtually all the financial engineering schemes which have been proposed are either infeasible, because they rely on unenforceable seniority rights, or else lead to paying too much for marginal debt. Second, countries which encourage direct foreign investment will do better if they do so by conventional means, rather than through debt-equity swaps. Debt-equity swaps are only worth employing in return for rescheduling concessions from lenders.

While financial engineering schemes will do little to solve the debt crisis, substantive policy reforms on the part of debtor and creditor countries alike would make an enormous difference. Debtors must be increasingly integrated into the world economy if they are to have larger gains from trade and the incentive to repay more of their debts.

## APPENDIX

Intermediate Case: When Higher Reserves Mean Higher Repayments

In section III.B, we argued that an increase in a sovereign debtor's cash reserves does not enable its creditors to bargain for higher repayments. Suppose instead that every dollar of a country's reserves increases creditor's ability to extract payments by  $q$  cents. This situation is intermediate to the corporate and sovereign extremes as presented in the text.

If a country has  $\$C$  in reserves, the value of bondholders' claims when repurchases are prohibited is

$$v(D) = \min(D, qC + \theta), \quad (A1)$$

where, as in the text,  $D$  is the face value of the country's total debt and  $v(D)$  is its face value;  $\theta$  is the random component of creditors' bargaining power.

A dollar spent on debt repurchase lowers the market value of the country's debt by the ratio of the price of marginal debt to the price of average debt, or  $Dv'(D)/v(D)$ , which must be less than one. However, although the benefit of a repurchase is less than a dollar, so too is its true cost. The true cost is

$$1 - q[1 - v'(D)] < 1. \quad (A2)$$

Intuitively, there is a  $1 - v'(D)$  chance that the country will not pay its bonds in full. In this case, lenders would receive  $q$  cents out of an extra dollar held in reserves. Therefore lenders effectively pay a portion of the repurchase cost.

Comparing the cost and benefit, small buybacks hurt a sovereign debtor if

$$1 - q[1 - v'(D)] > \frac{v'(D)}{v(D)/D} \quad (A3)$$

In the corporate case,  $q = 1$  and the inequality (A3) can never hold. In the case of a country, (A3) always holds (possibly with equality) when  $q = 0$  (as in the text), or if  $v'(D) = 0$ . Finally, it is possible to show that if a small buyback helps the country, then the country will benefit by spending all its cash on repurchases.

What is the appropriate choice of parameters in (A3) for a sovereign debtor? Given that a sovereign's creditors are rarely able to extract payments of more than a small fraction of exports over any extended period, and only a very small fraction of GNP, it seems unlikely that  $q$  is more than a few percent. But even if  $q = 1/3$ , inequality (A3) indicates none of the HICs in Table 1 is likely to benefit from a repurchase. For a country such as Mexico with  $v(D)/D = .5$ ,  $v'(D)$  would have to equal .4 for a repurchase to pay off. This would mean that only ten cents out of the fifty cent secondary market price is attributable to states of nature in which there is partial default.

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