LDC Debt Rescheduling: Calculating Who Gains, Who Loses

*Anthony Saunders and Marti Subrahmanyam**

Six years after the shock of Mexico's debt-repayment suspension in August 1982, the international debt problem remains with us. As of June 1987, Brazil alone had outstanding external bank debt plus nonbank trade-related debt of $89 billion.[1] This continuing debt problem has posed considerable difficulties both for the less developed countries (LDCs) and for the lending banks. Specifically, declining commodity prices and capital flight have made it far more

*This article is based in large part on a paper by Anthony Saunders and Marti Subrahmanyam, "Present-Value Analysis of Commercial Bank Debt Rescheduling," prepared in 1987 for the Country Studies Department of the World Bank. The authors are Professors of Finance at New York University's Stern School of Business. Professor Saunders is a Research Adviser to the Federal Reserve Bank of Philadelphia.

[1]In the Bank for International Settlements standings as of June 30, 1987, Brazil's total indebtedness amounted to $88,879 million. Mexico was next (with $80,708 million), followed by Australia ($40,718 million), the Soviet Union ($37,457 million), Argentina ($36,672 million), South Korea ($35,592 million), Venezuela ($25,577 million), Indonesia ($23,284 million), and Norway ($19,714 million). See *American Banker*, January 21, 1988.

difficult for the LDCs to meet their debt-repayment schedules, and U.S. banks have had to build up capital reserves (including their loan-loss reserves) in anticipation of potential defaults or write-offs on their loan portfolios.

In practice, LDCs and banks have dealt with these repayment problems by rescheduling outstanding loans into the future. The arrangement through which countries reschedule existing loans into the future is called a multi-year restructuring agreement, or MYRA. A good example of this restructuring was the Mexican MYRA signed in March 1985.[2] Under this agreement, a $5 billion loan made by 526 commercial banks in 1983 was restructured along with 52 previous loans totaling $23.6 billion. Basically, these 53 loans were repackaged into a new "loan" with principal (amortization) payments set to begin in 1987 and end in 1998. At the same time, a number of other contractual terms, such as interest rates, were also changed.

Who gains from the MYRA process—the country or the bank? And how much is gained or lost? In the jargon of bankers, the question might be rephrased this way: what is the size of the bankers' "concessionality"? This article proposes a method for measuring concessionality. It shows that under certain conditions, a MYRA is not a zero-sum game because both borrowers and lenders can gain something they want from the restructuring.

THE CONCEPT OF CONCESSIONALITY AND RESCHEDULING

Concessionality refers to the amount the lender gives up to the borrower when a loan is rescheduled. Traditionally, concessionality has been measured by a reduction in the interest rate the lender charges. For example, if before the MYRA the bank was charging 10% (the prime rate of, say, 8%, plus 2%) on a loan with a face value of $5 billion, and the MYRA reduced this loan rate to 9%, the bank was viewed as providing an annual concession of $5 million (that is, .01 times $5 billion) to the borrower. Note that the bank's concession typically is viewed as the borrower's gain.

Unfortunately, this simple measure overlooks the multi-dimensional nature of a MYRA. In addition to the interest rate, a number of other contractual terms are changed in the MYRA that will affect the loan's value. For example, the Mexican MYRA reduced interest rates, extended the maturity of the loan, granted a grace period before principal repayments began, changed the principal repayment (amortization) schedule, and imposed fees on the LDC to cover the MYRA's administrative costs. Each of these terms can be expected to have affected the (present) value of the loan. (See the GLOSSARY for brief definitions of the terms used in this discussion.)[3]

A better measure of concessionality, which takes into account all contractual aspects of the MYRA, is the present-value dollar amount that the lender gives up to the borrower at the time of the MYRA. Present-value calculations take into account the time-value of money. For example, a dollar of loans repaid next year is worth less than a dollar of loans repaid today. However, a dollar received (or paid) next year may be valued differently by different individuals. For example, John may have a strong preference for consuming today, while Jim prefers to consume in the future. So John is likely to discount a dollar received next year by a greater amount than is Jim. That is, John has a higher rate of time-preference, or time-value of money, than Jim does. Since lenders and borrowers may have different rates of time-preference, measuring concessionality using the present-value approach means that the lender's concessionality need not

[2]See "MYRA Makes the Years Roll By," *Euromoney* (October 1985) p. 29.

[3]Much of the terminology used in this paper was first suggested by Carl B. Weinberg, "The Language and Techniques of Multi-year Restructuring of Sovereign Debt: Lessons from the Mexican Experience," *Journal of Policy Modelling* (1985) pp. 477-90.

equal the borrower's gain. There need not be a winner and loser in a loan rescheduling.

A simple (present value) framework can be used to understand and measure the degree of concessionality a banker grants to an LDC at the time of a MYRA. This framework is general enough to be used in evaluating all types of loan rescheduling, domestic and foreign.

THE PRESENT-VALUE FRAMEWORK

The present-value approach measures the degree of concessionality to a borrower as the difference between the present value of the original (unrestructured) loan (PV_O) and the present value of the restructured loan (PV_R), taking into account all characteristics of the loan that may be changed in the restructuring.

That is:

$$\text{Concessionality} = (PV_O) - (PV_R)$$

If the difference is positive, there is a real element of economic subsidy to the LDC in the revised loan terms. If this difference is negative, it will imply that the borrower has lost out in the restructuring.

The Original Loan. Consider a country that currently (at time = 0) has a loan outstanding from an international banking syndicate. The face value of this loan is $100 million and it has a maturity of two years. The terms of the loan require equal amortization (A) of the principal over the two years — so that $50 million of the principal has to be repaid next year (year 1) and $50 million the year after (year 2).[4] The interest rate charged on the loan is the London interbank offer rate (LIBOR — see GLOSSARY) plus 1%, with interest charged on the outstanding balance of the loan. In this section we will assume that LIBOR is 9% for the life of the loan, so that the loan rate charged is 10%. These interest charges are represented by I. Since the borrower receives the funds now but will repay the funds in later years, the time value of money has to be considered in evaluating the true return on the loan to the bank. That is, the bank has to discount the repayments of principal and interest by its (opportunity) cost of capital.[5] The higher the bank's rate of discount, the lower will be the (present) value of principal and interest payments received from the LDC.[6]

In general, the present value of the original loan (PV_O) to the banker can be specified as being equal to:

$$PV_O = \frac{(A_1 + I_1)}{(1 + r)} + \frac{(A_2 + I_2)}{(1 + r)^2}$$

where

A_i = amortization (principal) payments in year i, i = 1 or 2

I_i = interest payments in year i, i = 1 or 2

r = the bank's discount rate (opportunity cost of capital).

Using the numbers in our example and assuming that r = 8%, then

$$PV_O = \frac{(50 + 10)}{(1.08)} + \frac{(50 + 5)}{(1.08)^2} = \$102.71 \text{ million.}$$

Thus the bank would be earning a (present value) net amount of $2.7 million (or a return of 2.7 cents per dollar) on the two-year loan.

The Restructured Loan. Suppose that soon after the loan is made the LDC unexpectedly finds these repayment terms and dates burdensome and asks the bank for a MYRA to avoid defaulting on the terms of the original loan.

[4]Amortization refers to the periodic repayments of principal on a loan.

[5]The bank's cost of capital reflects the risk-adjusted required return on investment by the bank's stockholders (i.e., their time-value of money).

[6]Note that the principal and interest received in year 2 are discounted at $(1+r)^2$, that is $(1+r)(1+r)$, where r is the bank's discount rate, because the lender has to wait (forgo consumption) for two periods before he receives the second year's dollar cash-flow repayments on his loan.

Under a MYRA, the two future principal payments of $50 million each are combined and rescheduled to some future date(s). The number of years for which amortization payments on the original loan are restructured is called the restructuring *window*. In our example the window is assumed to be two years. In the case of the Mexican MYRA discussed above, the window was six years since the negotiators were considering restructuring all amortization payments falling due between 1985 and 1990 under the original loan agreement (or prior restructuring agreements).

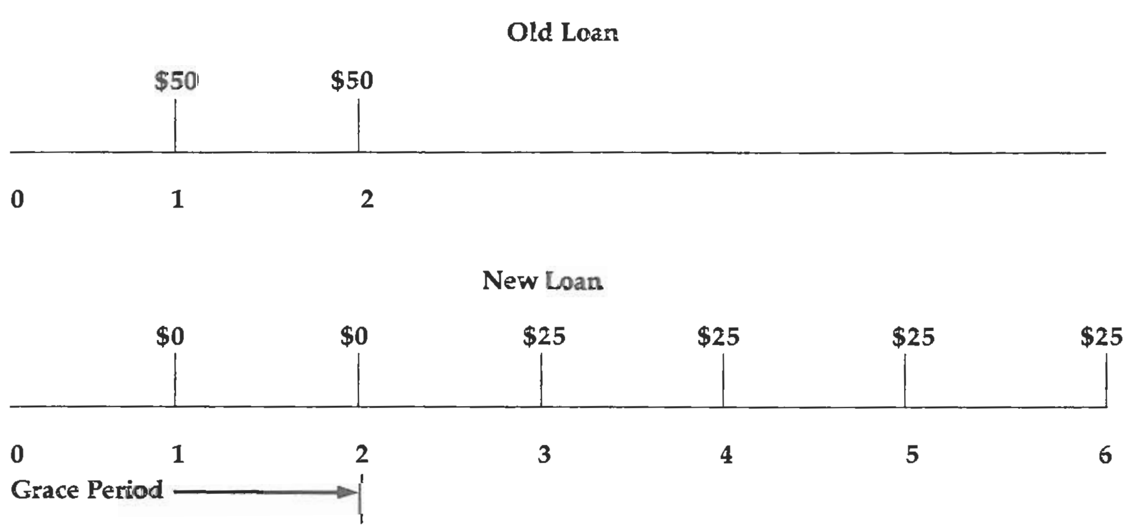
In addition, in most restructuring agreements, a *grace period* is allowed before any of the *revised* amortization payments have to be made. In our example, let us assume that the grace period is two years so that no amortization payments will have to be made by the LDC in years 1 and 2. We will also assume that the new amortization schedule is for four years beginning in year 3—after the two-year grace period—and therefore amounts to $25 million a year (i.e., $100 million face value divided by four).

The contrast between the old loan and the new MYRA loan principal repayments is shown in time-line form in Figure 1.

Now that we have restructured the principal repayments, we need to consider the interest payments. Let us suppose that the LDC will keep up interest payments on the original $100 million even during the grace period but that the interest rate is lowered from the original LIBOR plus 1% to LIBOR, that is, from 10% to 9%. Those who just analyze interest rate *spreads* might argue that this is a "concession" from the lender to the borrower that will ease his debt burden. However, whether or not this is so in a present-value

FIGURE 1

Principal Repayments (Amortization Schedule) on the Old Loan and the MYRA



framework is a complex question and will depend on a number of factors, including the grace period, the revised amortization schedule, and so on.

The last part of the restructuring deals with the administrative costs involved in a MYRA, which are usually passed on to the borrower. Such costs include getting syndicate banks to agree to a MYRA's terms, as well as the legal and administrative costs associated with contractual revisions. These costs usually take the form of an up-front fee (F) based on a percentage of the face value of the repackaged loan. Here, it is assumed that the fee is 1% of the original $100 million (i.e., $1 million), which is not an atypical amount.

The terms of the repackaged/rescheduled loan are summarized below:

Maturity	= 6 years
Amortization	= 4 years (25% per year)
Grace period	= 2 years
Loan rate	= LIBOR = 9% (assumed to be constant in this example)
Bank's rate of discount	= 8%
Up-front fee	= 1%.

Thus, in this case, the present value of the restructured loan to the bank (PV_R) is calculated as:

$$PV_R = F + \frac{I_1}{(1+r)} + \frac{I_2}{(1+r)^2} + \frac{(A_3 + I_3)}{(1+r)^3} + \frac{(A_4 + I_4)}{(1+r)^4} + \frac{(A_5 + I_5)}{(1+r)^5} + \frac{(A_6 + I_6)}{(1+r)^6}$$

and

$$PV_R = 1 + \frac{9}{(1.08)} + \frac{9}{(1.08)^2} + \frac{(25 + 9)}{(1.08)^3} + \frac{(25 + 6.75)}{(1.08)^4} + \frac{(25 + 4.5)}{(1.08)^5} + \frac{(25 + 2.25)}{(1.08)^6} = \$104.63 \text{ million.}$$

Measuring Gains and Losses. Although it looks as if the bank has made a concession by cutting the interest rate on the loan, the effects of the fee, grace period, and revised amortization schedule, as well as the bank's discount rate, combine to *increase* the present value of the loan from the bank's perspective. Lengthening the maturity of the loan and instituting a grace period increase the LDC's interest costs (measured in dollars) and, therefore, the bank's interest earnings. So the present value of the bank's net earnings on the new MYRA is $4.6 million compared to $2.7 million with the original loan.[7] The present-value framework clearly shows that the economic burden of the MYRA may be *favorable* to the lender even when the lender cuts the interest rate on the loan. (Although this particular example shows a MYRA that is favorable to the lender in present-value terms, lenders would be willing to negotiate MYRAs that involve concessions in present-value terms, provided the MYRAs' value exceeded the amount they would expect to receive if the borrower defaulted in part or in whole on the original loan.)

Just because the lender has gained from the

[7] In the case in which the grace period was extended to encompass year-1 and year-2 interest payments as well—such that the $18 million of interest payments was allowed to be amortized over the years 3, 4, 5, and 6 at $4.5 million per year—then the PV_R would have been $101.35, i.e., less than when the grace period is applied to principal alone and less than the original loan.

restructuring does not necessarily imply that the borrower has lost. Whether or not the borrower loses, however, is a slightly more complex question. If the LDC used the same discount rate as the banker, then the banker's gain would be equal to the LDC borrower's loss (that is, \$4.6 - \$2.7 = \$1.9). Nevertheless, it is quite possible, perhaps because of concerns about the societal effects (favorable or unfavorable) from borrowing overseas, that a country may apply either a higher or lower (social) discount rate to its interest and principal repayments.

Suppose, for example, that an LDC's population had a relatively high rate of time-preference for current consumption, implying that the LDC was less willing to sacrifice current consumption for future consumption, or that it had a relatively high marginal productivity of capital. This would then be reflected in a relatively high discount rate being applied to future repayments of interest and principal. If the borrower used a discount rate of 10% (compared to the bank's 8% discount rate), then the present value of the original two-year loan to the borrower would have been \$100 million.[8] And the present value of the rescheduled loan would be:

$$PV_R = 1 + \frac{9}{(1.10)} + \frac{9}{(1.10)^2} + \frac{(25 + 9)}{(1.10)^3} + \frac{(25 + 6.75)}{(1.10)^4} + \frac{(25 + 4.5)}{(1.10)^5} + \frac{(25 + 2.25)}{(1.10)^6} = \$97.55 \text{ million.}$$

So, if the borrower has a high discount rate relative to the lender, it is quite possible for the borrower to "gain" at the same time as the lender gains from a MYRA.[9] This possibility arises because of different valuations of the cash-flow repayments (interest and principal) over time by the borrower and the lender.

In sum, whether an LDC or any other borrower gains a concession from a lender under a MYRA will depend on a whole set of factors, including the bank's revised interest rate, fees, grace period, amortization period, and the discount rate applied to the revised schedule of payments to be made by the borrowing country.

EXTENSION OF THE PRESENT-VALUE APPROACH UNDER UNCERTAINTY

The simple framework developed above ignores interest rate, inflation rate, and exchange rate uncertainties, which have significant effects on the expected returns (and costs) of these loans. Moreover, actual contractual terms have been designed to deal with many of these uncertainties. However, uncertainty can be built into the simple model, in principle, with little difficulty.

Variable Spread. In the example above, it was assumed that the loan rate was fixed at a given percent above or below LIBOR for the life of the loan and that the underlying LIBOR did not change. These assumptions—which kept constant the spread between the loan rate and LIBOR—were made for simplification and can be relaxed in the present-value framework. Of course, LIBOR is likely to change over the life of the restructured loan (six years in our example). To handle this, we can make forecasts as to how LIBOR will change over the period of the restructured loan.[10]

---

[8]That is:
$A_1 = 50$ and $I_1 = .10 \times 100 = 10$, so $A_1 + I_1 = 60$
and $A_2 = 50$ and $I_2 = .10 \times 50 = 5$, so $A_2 + I_2 = 55$.

Therefore: $\frac{60}{(1.10)} + \frac{55}{(1.10)^2} = 100.$

[9]In this case, the borrower values the MYRA loan at \$97.55 million, compared to \$100 million under the original loan. Thus, the value of the savings is \$100 million - \$97.55 million = \$2.45 million.

[10]Alternatively, the cash flows can be valued on the assumption that they are swapped for a fixed-rate contract using an interest rate swap. For a discussion of interest rate

Then projected values of interest payments and estimates of concessionality can be made that are *conditional* on these interest rate projections.

In a similar fashion, we can relax the assumption that the spread between the loan rate and LIBOR is fixed. For example, in the 1985 Mexican MYRA the spread was variable (so-called *variable spread pricing*) with the LIBOR spread starting in 1985 at 87 1/2 basis points and rising to 125 basis points at the end of the loan.[11] This increase in the spread results in a larger nominal interest burden in the later years of the MYRA. While LDC borrowers with a very high (social) rate of discount might benefit from this (in a present-value sense) because they discount future interest rate payments at a high rate of time-preference, those borrowers with a relatively low discount rate might find such an arrangement less desirable. Indeed, for reasonable values of the fee, grace period, amortization, and so on, a borrower using a low discount rate may generally prefer a *declining* spread in the structure of interest payments rather than an increasing spread.

Inflation Uncertainty. One reason why LIBOR might fluctuate over time is because of changes in inflation expectations. LIBOR is a nominal interest rate, made up of a *real* rate of interest component and a premium component to adjust for expected inflation. Increases in the expected rate of future inflation will lead to increases in LIBOR. In addition, if the LDC's lending agreement provides that the loan rate will change as LIBOR changes (that is, the loan is a floating rate loan), then the future interest payments also will increase as the expected rate of inflation increases.

It is important to keep in mind, however, that if appropriate adjustments for inflationary expectations are made to forecast LIBOR, and to adjust the interest payments in the present-value calculation, then it is also important to make adjustments for inflationary expectations in the discount rate in the present-value calculations. This is because the lender presumably cares about the *real* (inflation-adjusted) time-value of the money he has lent; that is, he cares about the purchasing power of the funds he has lent. If the percentage premium added for inflationary expectations in the discount rate were the same as that used to adjust LIBOR, the adjustment would not affect the present value of the return on the loan. However, if the premiums were different, then the present value of the loan would be affected. For example, if inflation premiums on loans were to rise faster than the discount rate, then the present value of the loan would increase.

In addition, if the loan is a fixed-rate loan, for which interest payments do not increase as expected inflation rises, or if the loan rates can be adjusted very infrequently over the restructured period, then a continuously rising rate of expected inflation (in dollar terms) reflected in a bank's discount rate will lower the present value of the loan from the bank's perspective. On the other hand, the borrowing country could be expected to gain, in present-value terms, if its social rate of discount also reflected an inflation premium.

Option Features. A common aspect of several recent debt-restructuring agreements has been the incorporation of option features into the package. Most of these options are exercisable by the lender. Three major option features are part of many recent agreements: an *interest rate option*, a *currency option*, and an *option to convert debt into equity*. For example, in the 1985 Mexican MYRA, banks were given an interest rate option: they could choose among a variable loan rate based on LIBOR, a variable rate linked to the U.S. six-month certificate of deposit rate (adjusted for the costs of meeting the Federal Reserve's reserve requirements and the FDIC's deposit insurance premiums), and a fixed loan rate with a comparable yield.

The *interest rate option* not only gives the lender a choice between two (or more) interest rates at

swaps, see Jan Loeys, "Interest Rate Swaps: A New Tool for Managing Risk," this *Business Review* (May/June 1985) pp. 17-25.

[11]One hundred basis points equal 1 percentage point. See *Euromoney*, ibid., for a description of the Mexican MYRA terms.

the time of the restructuring, it also gives him a choice between a fixed or a floating interest rate. In general, the choice between these interest rates has to be made at the time the restructuring takes effect or just before the first interest payment is to be made. Thus, the lender has the option for a limited time (usually three months to a year) to choose between a floating rate and a fixed rate. If these interest rates do not move in tandem, the lender has a valuable option that can be exercised between the date on which the agreement is signed and the date on which the restructuring agreement takes effect. In some cases, this right to switch from one interest rate to another may be available at future dates as well.

The *currency option* usually allows the lender the right to choose between two or more currencies in which to receive loan repayments. Often the lender has the right to switch from the currency in which the loan was made either into U.S. dollars or back into his own domestic currency. Usually, this option can be exercised at the time the loan was relent as part of the debt-restructuring agreement or, if the loan was not relent, on the first interest payment date. In the case of the 1985 Mexican MYRA, non-U.S. banks were given the option of switching at most one-half of their loans into their home country's currency. (See VALUING A CURRENCY OPTION CONTAINED IN A MYRA.)

The March 1987 rescheduling of loans to the Philippines was a slight variation on the currency option in that it included an *equity conversion option*. In this plan, the country hoped to fund part of its interest payments by persuading lenders to accept foreign currency notes in lieu of interest payments. These notes, denominated in non-Philippine currencies and sold at a price well below face value, could be redeemed at any time during their six-year life for their full face value in Philippine pesos. If converted, the pesos could then be used to buy government-approved equity investments.

In a few equity conversion options, such as the one used by Chile, lenders are allowed to convert their debts directly into local currency at full face value—even if such debt has been bought at a discount. These local-currency-denominated loans may then be sold or exchanged for equity. This option is, therefore, essentially the choice between dollar-denominated payments versus local-currency-denominated payments.

Although valuing all three of these options

Valuing a Currency Option Contained in a MYRA

Suppose a lender makes a five-year loan to an LDC borrower. At the end of five years the lender has the option to be repaid either $10 million or 6.5 million British pounds —that is, he can be repaid either in dollars or in pounds. Also, suppose that the pound's spot exchange rate in terms of dollars five years hence is equally likely to be either $1.50 or $1.60. If the lender chooses to be repaid in dollars, he would receive $10 million regardless of the exchange rate. If the exchange rate at the end of the five years is $1.60, then if he chooses to be repaid in British pounds, he would receive 6.5 million pounds, which could be converted into $10.4 million. Since this is more than $10 million, he would elect to be paid in pounds and get $10.4 million. If the exchange rate at the end of five years is $1.50, then by choosing pounds the lender would end up with $9.75 million if he converted the pounds to dollars, which is less than the $10 million he would get by choosing to be repaid in dollars. So in this case he would be better off choosing to be repaid in dollars and receive $10 million. Consequently, under one exchange rate he would receive $10.4 million, and under the other he would receive $10 million. Since either exchange rate is equally likely, the lender should *expect* to receive a cash flow of $10.2 million (1/2 x 10.4 plus 1/2 x 10). We can now discount this *expected* cash flow under the currency option minus the cash flow without the option at the lender's rate of discount (r)—that is, $\frac{(\$10.2 - \$10.0)}{(1+r)^5} = \frac{(\$0.2)}{(1+r)^5}$ —to get the present value of this currency option.

precisely is highly technical, the basic intuition underlying their valuation is quite simple. The main determinant of value in all options is the uncertainty or *volatility* of the underlying variable, be it an *interest rate* or a *foreign exchange rate*. These options are valuable to the lender when the volatility of the underlying variables increases. This appears to have been particularly true of the *currency* conversion option, given the high degree of exchange rate volatility in recent years between industrialized countries' currencies (e.g., dollar versus yen, dollar versus mark, and dollar versus pound).

To illustrate the cost of ignoring or mispricing a currency option vis-a-vis an interest rate option, consider the case of the Sudan, which exercised an option in October 1985 to restructure the denomination of $1 billion of its debt from U.S. dollars to Swiss francs in order to reduce the interest expenses on its debt.[12] At that time, the Swiss franc had been depreciating against the dollar for several years. The case is interesting (and unusual) because the borrower (Sudan) had the option rather than the lending banks.

To quote:

> *"...at the option of the debtor, all of the restructured bank debt (almost $1 billion) was converted into Swiss francs from U.S. dollars. This transaction was part of a modification of the 1981 restructuring agreement and was signed in October 1985. The main reason for this transaction was to reduce the interest obligation on the restructured debt. The conversion was undertaken at a Swiss franc/U.S. dollar exchange rate of Swiss franc 2.17 per U.S. $1; at the end of September 1986, the Swiss franc/U.S. dollar exchange rate was Swiss franc 1.64 per U.S. $1."*[13]

If the exchange rate between Swiss francs and dollars had remained constant at 2.17 francs per dollar, the Sudan would have saved interest expenses by switching to "lower-cost" Swiss francs. But the Swiss franc actually *appreciated* about 30 percent to 1.64 francs per dollar by September 1986, so that the savings on the interest expenses were swamped by losses due to the change in the exchange rate. Since interest rate and exchange rate variables are strongly interconnected, the correlation between the two has to be taken into account when valuing such options.

Diversification of Risk. An important element of a debt-restructuring agreement is the risk attached to the future payment stream and the "risk premium," in terms of a higher interest rate, that the borrower promises the lender to compensate for the risk of default. A measure of this risk premium is the relative size of the spread, over an index such as LIBOR, charged on a particular loan compared to other loans.

What is an appropriate measure of this risk and, in particular, the risk for which the lender should be compensated? In the context of loans, the measure of default risk should compare the loss, in present-value terms, of not receiving future payments or of receiving an amount smaller than promised. One commonly used risk measure is the estimated variability of the future stream of cash flows from the loan.[14]

But not all of the *potential* variability of the cash-flow stream on a loan is relevant in measuring the risk from the lender's perspective. This is because an individual lender often diversifies by making loans to several different countries. While some factors are common to all borrowing countries in determining their future economic prospects, there are others that are country-specific and can be diversified away by holding a diversified portfolio of loans.[15] For example, the

[12]For details, see Maxwell Watson and others, "International Capital Markets: Developments and Prospects," International Monetary Fund *World Economic and Financial Surveys* (December 1986) pp. 60-61.

[13]Ibid., p. 61.

[14]This variability is typically measured by the standard deviation of the stream of cash flows from the loan.

[15]An article by L. Goodman, "Diversifiable Risks in International Lending: A 20/20 Hindsight View," *Studies in Banking and Finance* 3 (1986) pp. 249-62, provides empirical evidence on the diversification effect.

level of economic activity in industrialized countries, which determines the export earnings of the borrowing countries, may be a systematic or common factor influencing the earnings of all borrowers, as is the general level of world interest rates. On the other hand, the conditions in the market for a particular commodity, say, copper, may be specific to certain copper-producing countries. When the price of copper falls, the prices of some other commodities may rise.

To offset (or hedge) the risk of holding loans made to countries that depend on the copper industry, the lender can hold loans made to countries that depend on other commodities. For example, since some countries are big oil exporters and others are big oil importers, it is clearly possible to diversify international loan risk. This effect of portfolio diversification on the default risk the lender faces may be important in renegotiations between the lender and the borrower. Specifically, the borrower's knowledge that part of the default risk of the loan may be diversified away by lenders may help reduce the size of the risk premium or the margin over LIBOR in the restructuring agreement.

CONCLUSION

Measuring concessionality in a debt-restructuring agreement is a complex task given the number of contractual variables (interest rates, fees, options, grace period, and so on) and other variables (discount rates) that have to be considered. This complexity is compounded by the large number of original loans that are often packaged in a restructuring agreement. For example, the 1985 Mexican case involved 53 original loans whose cumulative present values would have to be compared with the present value calculated under the MYRA. These original loans differed in maturities, face values, interest rates, and other terms and were originated at different times. This does not mean that implementing the present-value approach is impossible, but rather that, in practice, it would be difficult and time-consuming. What is clear, however, is that it is possible for both borrowers and lenders to feel that they gain from a debt restructuring.

Finally, multi-year restructuring agreements are not the only way in which banks are dealing with the ongoing debt problems of LDCs. Apart from building up loan-loss reserves and writing down the values of their LDC loan portfolios, U.S. banks are increasingly engaging in LDC loan sales to third parties who wish to invest equity in LDCs. However, it is far from clear that such actions will fully resolve these loan problems, and additional approaches might be needed. These could be assessed using the present-value approach outlined in this article.