Economic Review

Federal Reserve Bank of San Francisco

Spring 1988 Number 2

U.S. Banks' Exposure to Developing Countries: An Examination of Recent Trends

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Outstanding research assistance provided by Alice Jacobson, John Nielsen, and Steven Dean. Special thanks to Emily Kwok and Irene Tong for assistance with the database. Editorial committee members were Hang-Sheng Cheng, Chris James and Vivek Moorthy.

U.S. banks' total LDC loan exposure and exposure relative to assets and capital have declined since the LDC debt crisis began in 1982. The authors find, however, that exposure to troubled LDCs has not fallen as much as exposure to more creditworthy borrowers, and that exposure has become increasingly concentrated at the largest U.S. banks. They posit three possible explanations: involuntary lending, banks' relative advantages in working with troubled borrowers, and the existence of deposit insurance, which distorts lending decisions.

In February 1987, the government of Brazil announced that it was suspending interest payments on its debts to commercial banks. This debt-service moratorium came as no surprise to the international financial community since Brazil's ability to meet the regularly scheduled payments of principal and interest on its obligations had been deteriorating for some time. Nonetheless, Brazil's action underscored the lingering concerns about a number of lesser developed country (LDC) debtors following the 1982 debt crisis.

In view of renewed worries about the economic health of LDC debtors and the continued high level of exposure to those borrowers within the U.S. banking industry, a number of U.S. banks took action to increase their loan loss reserves in June 1987. All told, these additions to loan loss reserves amounted to over $15 billion. Bank stock values responded favorably, but questions remain concerning the adequacy of these actions.

Moreover, bank regulators remain concerned about U.S. banks' exposure to developing countries. For example, as part of its risk-based capital proposal announced in July 1987, the Federal Reserve Board suggested that all banks with large exposures to high-risk countries be required to maintain capital positions above the minimum ratios.

This paper examines U.S. banks' exposure to international borrowers, with a particular emphasis on the subset of troubled LDCs. It attempts to explain the pattern of exposure that apparently concentrates international lending risk in the banking system. The paper is organized in the following way. In the first and second sections, we describe the events leading up to the debt crisis that erupted in August 1982, when Mexico announced a moratorium on debt service, and how the debt crisis affected bank lending to developing countries.

Readers who are familiar with this background material may wish to turn directly to the third section where we take a closer look at U.S. banks' exposure to developing countries since the debt crisis. We find a number of surprising and possibly disturbing developments, including an increase in U.S. banks' exposure to troubled LDCs relative to their exposures to other international borrowers and an increasing concentration of that total exposure at the largest U.S. banks. In the fourth section, we attempt to explain these developments. The paper concludes with a discussion of policy implications.

I. LDC Lending in Historical Perspective

Prior to the 1970s, longer term lending to developing countries occurred primarily through official sources. The bulk of private capital flows, to the extent they occurred, took the form of foreign direct investment. Private lenders such as commercial banks tended to provide funds primarily to finance trade.

Even before the first oil crisis in 1973-74, however, the role of private lenders began to change dramatically. Some have suggested that the rapid rise in the U.S. money supply in the early 1970s and the adoption of floating exchange rates increased liquidity, particularly in the form of Eurodollars, and led to a rise in international lending by commercial banks. The first oil shock then generated current account deficits for oil-importing countries and equally large surpluses in the current accounts of the Persian Gulf countries. Private lenders, most notably commercial banks, facilitated the flow of funds between lending and borrowing countries.

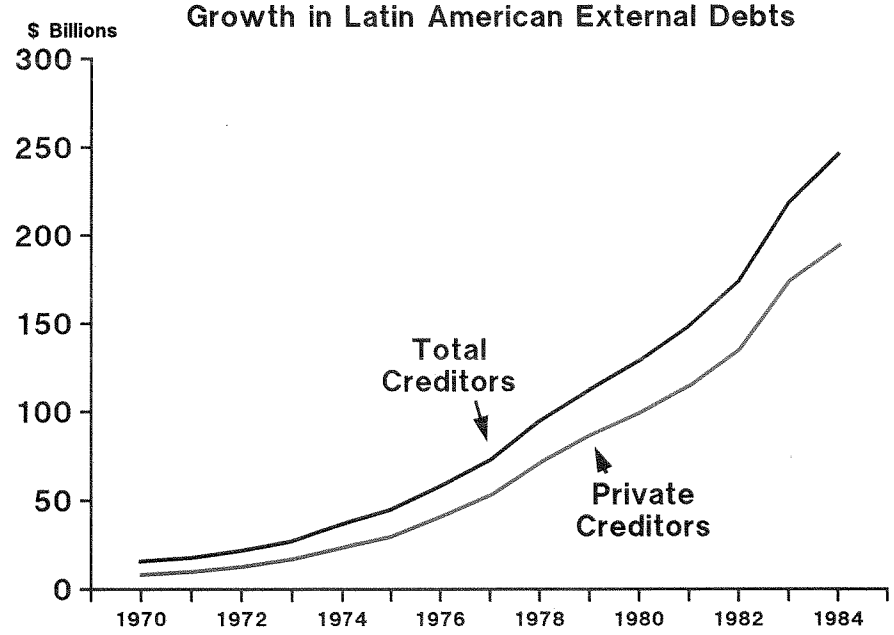
Chart 1 shows the growth in the external indebtedness of Latin American countries to all countries from 1970 through 1984. It is clear that private lenders' (primarily banks) share of the total funds advanced to those countries increased significantly. Moreover, data on bank lending suggests that U.S. banks took an active role in supplying credit to LDCs generally, with exposure reaching a peak of $166.2 billion in 1983.

Although several developing countries experienced debt service problems during this period, in general, the high inflation of the middle and late 1970s guaranteed that the real, or inflation-adjusted, debt service burden was quite low because loans were repaid in devalued dollars. Moreover, rapid growth of the economies of the industrial countries generated strong demand for the exports of developing countries. Consequently, very few LDCs experienced payment difficulties despite the rapid growth in the nominal value of their indebtedness.

Beginning in the early 1980s, a number of factors combined to increase LDC debtors' real debt burdens. First, real interest rates rose dramatically as central banks moved to reduce inflation by tightening credit. The rise in real interest rates was translated immediately to LDCs' borrowing costs since most of LDCs' debt was short- or medium-term at floating rates tied to a market rate, such as LIBOR (London Inter-Bank Offer Rate). Second, in 1982, worldwide inflation unexpectedly abated. Long-term debt obligations that were contracted on the assumption that export prices would continue rising suddenly became more costly in real terms. Worse yet, the decline in inflation was not translated into lower nominal interest rates.

Moreover, the value of the dollar, the currency in which most loans to LDCs were denominated, rose relative to

Chart 1
Growth in Latin American External Debts



Source: The World Bank, World Bank Debt Tables

LDC currencies, making it more expensive for developing countries to earn dollars with which to service their debts. Ordinarily, the rise in the value of the dollar would have stimulated demand for developing countries' exports, enabling them to generate additional foreign exchange. Instead, a worldwide recession reduced the demand for developing countries' exports and made it extraordinarily expensive for LDCs to obtain foreign exchange to service their debt obligations.

These developments culminated in Mexico's announcement in August 1982 that it was imposing a moratorium on the payment of interest on its debt obligations. A payments "crisis" ensued. Mexico's creditors were able to negotiate a "restructuring" of Mexico's debt to alleviate near-term debt service problems, but by then a number of other LDCs were experiencing similar difficulties.

At this point, default on LDC loans and the potential for collapse of the international financial system became a real concern. Official policymakers and private lenders adopted similar approaches to managing the crisis for all debtors experiencing difficulties. First, to obtain short-term financing from the IMF (International Monetary Fund), the debtor country had to reach an agreement with the IMF concerning an economic reform program designed to improve the longer term outlook for its debt service capacity. Second, once an IMF agreement was reached, banks had to reach an agreement with the debtor to reschedule their loans. Initially, these reschedulings established higher fees and spreads over the cost of funds to compensate banks for lengthening loan maturities. In subsequent reschedulings, spreads and fees were reduced even as loan maturities were extended. (Actually, funds provided by the IMF also were conditioned upon the country reaching an agreement with its bank creditors.) Finally, in a number of cases, banks also provided additional new funds at reduced interest rates primarily to enable countries to cover their contractual interest payments. Typically, banks participated in these new loans in proportion to their outstanding exposures to the borrower.[1]

II. Bank Lending and Changing Risk Perceptions

As the crisis unfolded, investors abruptly changed their assessment of the probability of default on LDC debt obligations. This sort of change in perceived default probabilities can be inferred from the sharp decrease in the value of outstanding claims on LDCs. The behavior of prices in the bond, bank loan, and, indirectly, the bank equities market is consistent with this view.

Articles by Edwards (1986), Folkerts-Landau (1985) and Dornbusch (1986) examine the international bond and bank loan markets' reactions to Mexico's announcement. These articles compare yields on international and foreign bonds issued by individual developing countries with those issued by industrial countries. They find that the yield spread increased dramatically in the third quarter of 1982, suggesting that investors required substantially higher default risk premia for LDC debt than previously. It is interesting to note, moreover, that default risk premia increased for all the major non-OPEC LDC debtors, suggesting an across-the-board reassessment of default probabilities with respect to LDC debt. Edwards also finds that the international bond market only anticipated the debt crisis by a few weeks, and then only partially.

In addition to the evidence from the international bond market, these articles find that risk premia on bank loans to LDCs rose during the early 1980s, as well. Terrell (1984), for example, notes that spreads over LIBOR for selected major LDCs increased from an average of 125 basis points through the first seven months of 1982 to 217 basis points during 1983.

Additional evidence for the change in perceived default risk is available from the secondary market for bank loans to LDCs. This market has existed for some time but became more prominent after the onset of the debt crisis. For example, the financial press noted the emergence of secondary market discounts of 10 to 25 percent relative to the face value of LDC loans in 1983.[2] (Secondary market discounts of 50 percent or more are not uncommon for loans to certain LDCs today.) Since the trading volume in this market was (and still is) quite thin, prices may not give an accurate indication of the *level* of default risk, but the *change* in those prices provides at least some indication that investors' assessment of default risk changed for the worse.[3]

Other studies have focused on the stock market's reaction to the debt crisis. In general, these studies conclude that investors tended to discount the market values of banks that had large exposures to developing country debt. Beebe (1985), for example, found that between 1982 and the end of 1984, the sharp downward valuation of the equities of the largest bank holding companies (those with assets over $10 billion) can be explained in part by their individual exposures to Latin American debtors, specifically Argentina, Brazil, Mexico, and Venezuela. Kyle and Sachs (1984) likewise find evidence that the market tended

to discount the share prices of banks with significant exposures to Argentina, Brazil, Chile, Mexico, and Venezuela between September 1982 and June 1983.[4]

Given the strong evidence for an increase in perceived default risk following Mexico's actions, one would expect to see a sharp decrease in the supply of loans to LDCs. While it may be difficult to attribute patterns in LDC lending to supply versus demand factors, the observed decline in new lending is at least consistent with the view that lenders became less willing to extend credit after the debt crisis. According to data published by the Organization for Economic Cooperation and Development (OECD), new medium- and long-term bank lending to LDCs dropped from an average of $39.2 billion a year in the period between 1978 and 1982 to $24.1 billion after 1982.[5]

Moreover, only a relatively small proportion of the "new" lending to LDCs after the crisis actually represents a net increase in the amount of borrowed funds available to those countries. Instead, most of the new lending reported by the OECD involves rollovers of maturing obligations and/or reschedulings. Net new funds typically have been provided only to enable the borrower to meet interest payments coming due on outstanding obligations. In addition, most of the lending (whether on a net or a gross basis) has been considered "involuntary" in the sense that it takes place at below-market clearing rates and commercial bank lending syndicates have had to invoke "fair-share" rules with varying degrees of success as a means of inducing members to continue to provide funds.

In fact, because commercial bank lending to LDCs dropped off so dramatically, in October 1985, Treasury Secretary Baker announced the so-called Baker Plan. The Plan established modest goals for concerted net new lending by commercial banks in conjunction with increased official lending to the fifteen principal LDC debtors. (For a list of the "Baker Fifteen," see Appendix A.) Nonetheless, net new lending to these countries has been meager at best. In 1986, loans outstanding actually declined by nearly $3 billion.[6]

III. Effect on U.S. Bank Portfolios

The increase in the perceived probability of default on LDC loans lowered the value of the loans outstanding to LDCs. As a result, U.S. banks suffered market value capital losses even though they generally did not re-value LDC loans on their books, or increase their loan loss reserves significantly until the spring of 1987. Based on data compiled from a variety of sources, U.S. banks apparently wrote down only $2.2 billion, or approximately 1.7 percent, of their loans to non-OPEC LDCs between 1982 and 1985.[7] Moreover, total provisions to increase loan loss reserves likewise were modest, averaging approximately 0.51 percent of assets per year during this period.[8]

However, U.S. banks did take other steps to counter the effects of the decline in the market values of their portfolios. For example, banks raised additional capital through increased retained earnings, asset sales, and sales of new equity and subordinated debt. They also curtailed asset growth overall, and LDC loan growth particularly. Terrell (1984) notes, for example, that banks raised front-end fees on LDC loans as a means of curtailing lending. Outstanding loans to LDCs fell from a total of $152.6 billion in 1981 to $133.6 billion at the end of 1986. As a result of these actions, exposure to LDC debtors steadily fell between 1982 and 1986.

Charts 2 and 3 show the marked change in U.S. banks' LDC debt exposure, in relation both to total assets and book value capital for those banks with significant international lending exposure.[9] In the years preceding the debt crisis, both total assets and book capital grew at roughly the same annual rate (11.9 and 11.6 percent, respectively), while loans to LDCs grew at a faster rate (14.9 percent, on an annual basis). As a result, both measures of LDC loan exposure rose between 1977 and 1982, the former reaching more than 13 percent of assets and the latter more than 243 percent of capital. Then, beginning in 1982, exposure relative to capital, in particular, declined. By 1986, it was about half the level of 1981.

Most of this decline is the result of banks' efforts to raise book capital. Between 1982 and 1986, banks increased capital at a 13.2 percent annual rate, while LDC loans outstanding declined at only a 5.0 percent annual rate. Most of these loans originally were short-term, and banks, in theory, could have chosen not to refinance them upon maturity. In practice, once the credit had been extended, banks apparently were unable to force repayment of principal.

Moreover, closer examination of the patterns of exposure — among LDCs and other international borrowers, as well as exposure by size of bank — yields some interesting and possibly disturbing observations. First, exposure to all nations excluding LDCs, declined more rapidly than total LDC exposure. For example, U.S. banks' exposure to the major industrial nations, that is, the

G-10 countries plus Switzerland, declined 57.3 percent from 210 percent of capital in 1981 to 90 percent in 1986. Total international loan exposure relative to capital declined by 55.2 percent. In contrast, LDC loan exposure declined by 52.7 percent. Thus, the decline in LDC loan exposure is not nearly as dramatic when one considers the decline in lending to other, more creditworthy international borrowers.

Second, within the category of LDC borrowers, the decline in U.S. bank exposure has varied, with more dramatic declines reported for the LDCs that are not experiencing debt problems. To analyze this development, we grouped LDCs into two categories — "troubled" and "not troubled". The troubled borrowers were selected according to the following criteria: they received a rating of worse than average by *Institutional Investor*, and/or their outstanding bank loans were trading at a discount of more than ten percent of face value in the secondary market. Furthermore, in most cases, troubled countries have a recent history of balance of payments difficulties, economic instability, and actual defaults on their obligations. (Appendix A contains a list of the countries that fall into the troubled category, as well as a list of the "Baker Fifteen" countries.)

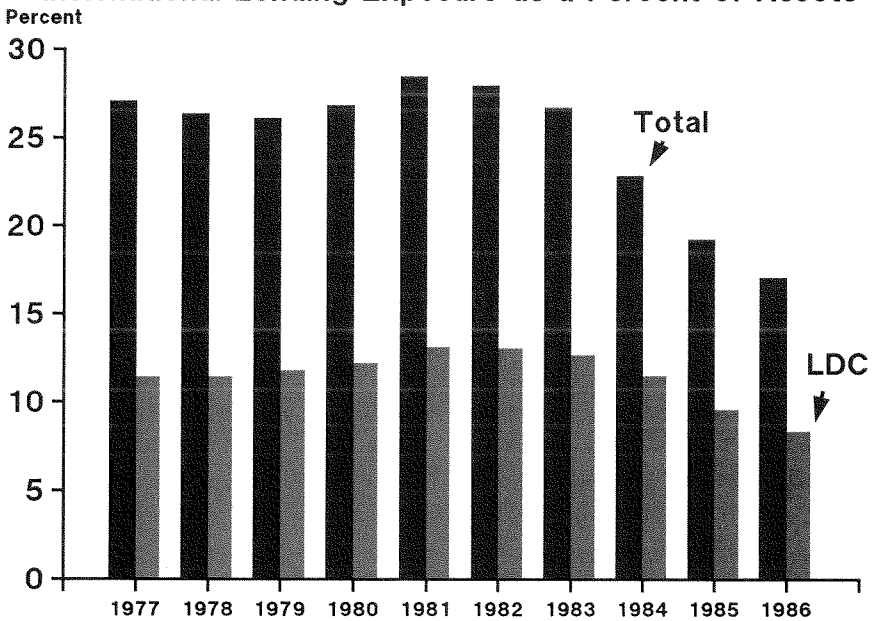
One way of measuring the change in banks' exposure to these two groups that attempts to control for the common factors that may have caused a general decline in international lending is to examine the change in these borrowers' shares of U.S. banks' international loan portfolios. Thus, Table 1 shows that exposure to what we have termed troubled LDCs has risen from 26.1 percent of banks' international loan portfolios in 1982 to 29.4 percent in 1986. Moreover, exposure to the Baker Fifteen has risen from 25.9 to 31.3 percent of banks' international loan portfolios. At the same time, loans to industrialized countries have fallen from 39.7 percent to 37.7 percent, and loans to nontroubled LDCs have fallen from 12.0 percent to 11.5 percent.

Thus, although borrowing by troubled LDCs has declined in absolute terms, borrowing by more creditworthy borrowers has declined by more. As a result, banks' relative exposure to troubled LDCs has risen. By implication, banks have tended to keep the worst risks in their portfolios. Consequently, the decline in total LDC exposure observed in Charts 2 and 3 overstates the decline in U.S. banks' exposure to default risk associated with lending to LDCs.

A third observation is that exposure by size of bank also has varied, with the nine largest banks holding a larger percentage of troubled LDC loans now than in 1981. As a percentage of total loans outstanding to troubled borrowers, the nine money center banks reporting on the

Chart 2

International Lending Exposure as a Percent of Assets



Source: Country Exposure Lending Survey

Table 1
Shares of U.S. Banks' International Loans Outstanding by Country Group
(Millions of Dollars; Percent of Total)

Year	Total		G-10 and Switzerland		Non G-10 Developed		OPEC LDCs		Non-OPEC LDCs Non-Troubled		Non-OPEC LDCs Troubled		Baker 15		Other	
1977	$194571	100%	$83610	43.0%	$16114	8.3%	$15945	8.2%	$14479	7.4%	$50699	26.1%	$40992	21.1%	$13723	7.1%
1978	217337	100	92044	42.4	17172	7.9	21342	9.8	17337	8.0	54117	24.9	47485	21.8	15324	7.1
1979	246161	100	99065	40.2	18330	7.4	22347	9.1	22958	9.3	63716	25.9	54826	22.3	19745	8.0
1980	286527	100	118503	41.4	20997	7.3	23319	8.1	29935	10.4	74739	26.1	66846	23.3	19034	6.6
1981	332057	100	131422	39.6	26084	7.9	25441	7.7	37626	11.3	87708	26.4	81520	24.6	23776	7.2
1982	352293	100	139824	39.7	29742	8.4	27760	7.9	42424	12.0	92033	26.1	91084	25.9	21509	6.1
1983	357343	100	136766	38.3	32417	9.1	28613	8.0	43717	12.2	93897	26.3	94229	26.4	21933	6.1
1984	323324	100	113400	35.1	30529	9.4	26164	8.1	39019	12.1	93819	29.0	95375	29.5	20393	6.3
1985	294542	100	105528	35.8	26986	9.2	22242	7.6	33761	11.5	87257	29.6	90525	30.7	18769	6.4
1986	275639	100	104017	37.7	22728	8.2	19550	7.1	31676	11.5	81112	29.4	86172	31.3	16556	6.0
Mean				39.3		8.3		8.2		10.6		27.0		25.7		6.7
Standard deviation				2.5		0.7		0.7		1.7		1.6		3.6		0.6

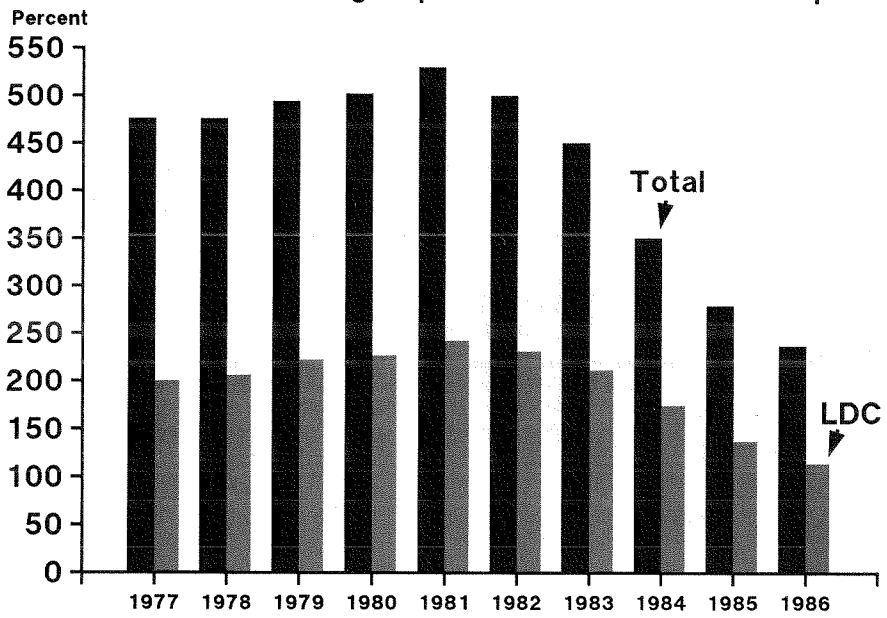
Figures may not add due to rounding
Source: Country Exposure Lending Survey, Federal Reserve Board

Table 2
Shares of U.S. Banks' Exposure to Troubled LDCs by Size of Bank
(Millions of Dollars; Percent of Total)

Year	Total		Nine Money Center Banks		Next 14 Largest Banks		All Other Banks	
1977	$50699.4	100	$30757.0	60.7	$ 9389.5	18.5	$10552.9	20.8
1978	54116.7	100	32585.3	60.2	10155.8	18.8	11375.6	21.0
1979	63715.7	100	39482.7	62.0	11320.3	17.8	12912.7	20.3
1980	74738.8	100	44388.0	59.4	13273.2	17.8	17077.6	22.8
1981	87707.8	100	50099.5	57.1	16565.1	18.9	21043.2	24.0
1982	92033.3	100	51925.2	56.4	18249.9	19.8	21858.2	23.8
1983	93896.8	100	53571.3	57.1	18594.1	19.8	21731.4	23.1
1984	93819.2	100	56004.5	59.7	18492.3	19.7	19322.4	20.6
1985	87257.0	100	54084.3	62.0	15496.7	17.8	17676.0	20.3
1986	81112.0	100	50884.0	62.7	14521.0	17.9	15707.0	19.4
Mean				59.7		18.7		21.6
Standard deviation				2.1		0.8		1.6

Figures may not add due to rounding
Source: Country Exposure Lending Survey, Federal Reserve Board

Chart 3
International Lending Exposure as a Percent of Capital



Source: Country Exposure Lending Survey

CELS now hold 63 percent compared to a low of 56 percent in 1982. Table 2 shows that, in contrast, the other two groups of banks — the next 14 largest and all other international lenders — systematically reduced their proportional shares of the total U.S. bank exposure to troubled LDCs. To a certain extent, this reduction represented a shift toward more creditworthy borrowers and a general tendency to reduce international lending altogether.

In terms of absolute changes in exposure, the nine money center banks reduced their troubled LDC loans outstanding by only $1 billion, while the next 14 largest banks and all other banks reduced theirs by $4 billion and $6 billion, respectively, from 1982-1986. The latter two groups tended to be more active sellers of loans in the secondary markets. Also, the non-money center banks' participation in involuntary new lending arrangements associated with debt reschedulings has been relatively limited. For example, *Fortune Magazine* reported in July 1983 that many of the nine largest banks provided more than their proportional shares of the rescheduled loans to Brazil because the other lenders, including many in the next-largest category, provided substantially less than their original shares.[10]

IV. Explanations

Many observers now suggest that involuntary lending provides an explanation for these patterns in U.S. banks' exposure to LDCs. As noted earlier, LDC borrowers were able to meet debt service obligations through additional borrowing prior to the crisis. However, with the decline in the market's perception of these borrowers' creditworthiness, new funds became scarce.

To induce existing lenders to provide some relief, a number of debtors threatened to default. Lenders with outstanding claims against these borrowers, then, were faced with the choice of forbearing and/or rescheduling those claims, selling the claims at a discount to other creditors, or declaring the borrowers in default and attempting to recover value through whatever remedies might be available. The sale of such claims at a discount would have involved the recognition of accounting losses, and declaration of default probably would have entailed even greater losses since the value of collateral generally was less than the discounted value of the claim. Lenders therefore may have been reluctant to pursue either of these two options, particularly when the exposure to a given borrower was large relative to the lender's capital. Consequently, lenders — particularly the largest ones with the largest exposures and thus the most to lose in the event of

default — may have "chosen" to reschedule existing loans and even to extend new loans to cover interest payments on existing obligations to avoid losses associated with default.

However, because *all* existing lenders, whether they participated or not, would have benefitted from the extension of new credit, LDC lending syndicates had to invoke fair-share rules to ensure that adequate additional funds were provided to prevent default. Nonetheless, lenders with relatively small outstanding exposures had little incentive to participate in such lending. This may explain the difference in the patterns of exposure among the three size categories of U.S. banks.[11]

While the involuntary lending explanation is consistent with the patterns we have observed for banks, it is not entirely satisfactory. A number of troubled LDCs also had bonds outstanding prior to the crisis. In the absence of distortions, one would expect, on the basis of the involuntary lending explanation, the two groups of lenders — the bondholders and the banks — to respond similarly to the debt crisis. Yet the two appear to have responded quite differently.

Nearly all accounts of the management of the debt crisis suggest that it was the bank lenders and *not* the bondholders that were involved in debt reschedulings and extensions of new credit. Moreover, data on funds raised in international capital markets also suggest that unlike bank loans, bond financing, at least for certain countries, became nonexistent after the crisis.

This implies, in other words, that reliance on bank loans increased relative to bonds as the credit rating of the borrower declined. Moreover, nonbank creditors apparently became even more reluctant to supply funds to a borrower with a given low credit rating after the crisis than before.

To show the difference in the way bank lenders and bondholders behaved, we regressed the ratio of bank loans to total external funds raised (including bonded debt) in international capital markets by a given country in a given year on the credit rating of that country for that year. Clearly, because of the way this ratio is defined, an increase implies that reliance on bonded debt has decreased. Bank loans were defined as the sum of international bank loans and foreign bank loans, but not floating

Table 3

Percent of Bank Loans to Total Funds Raised (OECD)

Year	G-10	Non-LDC	LDC	Non-Troubled	Troubled	Baker 15
1977	34.2	37.1	80.9	74.5	78.1	78.3
1978	65.1	61.4	86.6	86.5	88.0	87.5
1979	42.7	51.1	93.9	95.2	92.9	93.7
1980	55.6	59.3	95.4	97.0	93.9	95.1
1981	27.1	34.3	79.1	89.5	72.8	73.8
1982	38.5	43.3	82.1	75.7	84.6	86.1
1983	20.4	26.2	85.7	72.3	98.0	98.2
1984	44.1	46.2	89.4	75.6	100.0	100.0
1985	35.7	38.0	74.7	61.8	98.8	99.3
1986	20.5	25.7	76.0	73.9	38.0*	42.3*

** The relatively low ratio of bank loans to total funds raised by these countries reflects the problems Mexico and Brazil encountered in rescheduling their bank loans in 1986. If Mexico's rescheduled debt, which appears in the second quarter of 1987 figures were included in the 1986 total, these ratios would be close to 100 percent.*

rate notes held by banks. For the credit rating, we used the country ratings published annually by *Institutional Investor* as a proxy for creditworthiness. Ideally, some sort of market measure like the actual market prices of loans would be appropriate. However, the secondary market for bank loans is thin and quotes prices for only a handful of countries. A test of the extent to which the *Institutional Investor* ratings are a good instrument for the secondary market discounts revealed that at least for the few countries for which discounts are quoted, the ratings are indeed a good proxy.[12]

To test for a change in LDCs' access to nonbank sources of funds after the crisis (and controlling for changes in creditworthiness), we included a dummy variable that takes the value of zero prior to 1982 and the value of each country's credit rating afterwards.

We used data compiled by the OECD for a sample of approximately 62 countries between 1980 and 1986.[13] These countries represent the major international borrowers during this period and include 23 industrial countries, as well as 10 OPEC, 24 non-OPEC LDCs, and 5 Eastern Bloc countries. Table 3 presents the OECD data grouped by type of borrower.

The results of our pooled cross-section time-series regression are summarized in Table 4. The negative and statistically significant coefficient on the credit rating suggests that as LDCs' creditworthiness deteriorated, bond financing "dried up" and they were forced to rely increasingly on bank loans as a source of funds. Moreover, the negative and significant coefficient on the credit rating dummy variable suggests that for a given level of creditworthiness, access to alternative sources of funds diminished after the crisis.

Table 4

Reliance on Bank Lending vs. Bond Financing

Dependent Variable: Ratio of International and Foreign Bank Loans to Total External Funds raised on International Markets by Country.

Independent Variable	Parameter Estimate
Intercept	1.185** (36.99)
Rating	−0.007** (−11.12)
Rating Dummy*	−0.003** (−6.10)
Number of Observations	492
Adjusted R-squared	.36
t-statistics are in parentheses	

* *Rating Dummy: Rating * Dummy post-1982 (= 1 after 1982).*
** *Significant at the 1 percent level.*

These findings are consistent with the view that after the debt crisis, a number of LDC borrowers were unable to obtain funds from other sources and that it was the *banks* that were "forced" to renew and reschedule existing loans to avoid defaults and to protect their investments. This would explain the small decline in banks' exposure to troubled borrowers relative to the decline in exposure to more creditworthy borrowers.

Given that the banks appear to have responded differently to the debt crisis than did the bondholders, the question remains as to why. The involuntary lending explanation does not adequately address this issue. Assuming that neither the bankers nor the bondholders were willing to "throw good money after bad," bankers must have had some inducements to continue lending that bondholders did not have. Two explanations come to mind. First, bankers may have had superior information on the ability of LDC debtors to repay, and/or superior ability to obtain repayment. Second, bank lenders may have had regulatory incentives to lend that were not available to bondholders.

In the analysis that follows, these two alternatives are examined as two different (but not necessarily mutually exclusive) factors that may have played a significant role in determining banks' willingness to lend to LDCs both before and after the crisis.[14] The first one, the "efficiency factor," has to do with advantages banks may have relative to bondholders in assessing and monitoring riskier credits and in handling problem loan workout situations. The second factor, the "subsidy factor," relates to the effects government subsidies (implicit or explicit) may have had on banks' and investors' portfolio decisions.

Efficiency Factor

One factor that may account for the increase in banks' exposure to LDCs throughout the 1970s, and, therefore, may have had a bearing on banks' response to the debt crisis is what we have termed the efficiency factor. This explanation focuses on banks' relative advantages as agents for investors in assessing the creditworthiness of borrowers, monitoring borrowers, and working through repayment problems. It draws on insights from models of principal/agent problems in lending.[15]

Broadly speaking, borrowers and investors (that is, the ultimate lenders) may use two types of financial instru-

ments to transfer savings. These can be characterized as bonds (direct finance) on the one hand, and bank loans (intermediated finance) on the other. The choice between the two will depend on the one that provides borrowers with the cheapest source of funds and investors with the highest return net of the costs associated with administering their investment. Among the usual costs associated with administering an investment are the costs of collecting and maintaining records of scheduled principal and interest payments, but they also include the cost of more or less continuously monitoring the borrower's financial condition. This sort of monitoring is necessary to prevent borrowers from engaging in activities that reduce the value of the lenders' claims.

For some borrowers, the costs of such monitoring are relatively modest since publicly available information conveys an accurate picture of their true net worth and, therefore, the likelihood of default. Since investors can readily determine when action is needed to protect the value of their claims, these borrowers generally will prefer bond finance because the standard covenants contained in bond indentures will provide adequate protection for investors at the lowest cost.[16, 17]

For other borrowers, however, monitoring may be costly because their assets are not traded and are therefore difficult to evaluate. In these cases, the standard financial ratios on which bond covenants rely will not convey accurate information about the borrower's true condition. In fact, if these borrowers were to use bond finance, it is possible that they might violate standard bond covenants and therefore be forced to seek new sources of credit or even be forced into liquidation, even though better information would have indicated that such actions were unnecessary and costly to both borrower and investor.

These borrowers therefore will prefer bank loans because banks typically have access to information about their condition that is not readily available to investors directly. For example, banks may have information about a borrower's payments activity and transactions balances that investors do not. Consequently, banks will be able to monitor the condition of these borrowers more cheaply than could the individual investors, making bank loans the cheaper source of funds. In a sense, then, the obligations of these borrowers could be worth more to investors when held in bank portfolios.

This analysis is applicable to international lending, although solvency may not always be the proper measure of default risk. Instead, a more general approach would be to treat default risk as a function of the cost of default. In cases where actual insolvency is not at issue, default risk would be defined as the value of unrestricted future access to external borrowed funds plus the value of seizable assets, to the extent such assets exist.[18] Thus, a sovereign borrower will not default as long as the cost of doing so exceeds the value of its external obligations.

Assuming investors can readily determine the value of a given borrower's external obligations relative to the cost of defaulting on those obligations, bonds will be the preferred financing vehicle. Presumably, most industrial countries as well as those LDCs with relatively small amounts of debt outstanding, significant wealth, and high returns to capital investment will be the countries that can tap the bond markets.

In contrast, LDCs that have high amounts of debt outstanding relative to GNP or other measures of capacity, or have unstable political regimes such that default through repudiation is a possibility, have found their ability to raise external funds through bond finance severely limited, and thus have had to rely chiefly on bank loans. To the extent that investors are willing to hold these obligations at all, they appear to prefer to hold them indirectly because banks can monitor and work with problem borrowers more cheaply, and because banks have better access to assets that may be seized than do individual investors.

Banks' apparent advantage in providing credit to higher risk borrowers suggests that, given the increase in demand for external funds on the part of LDCs in the 1970s, banks would have been the logical ones to supply most of the needed funds. Moreover, this analysis suggests that once the debt crisis erupted and investors became less certain of the chances of being repaid, the value of banks' ability to gauge solvency risk and to handle workout situations would have increased. Therefore, one would expect to see banks holding proportionately more of troubled LDCs' debt than before the crisis. One might also expect the banks' share of the outstanding obligations of nontroubled borrowers to fall as the debt crisis changed the relative values of these obligations as well.

This theory is consistent with the results of our regression findings that banks and *not* bondholders were involved in continued lending to troubled LDCs. Moreover, it helps to explain why banks continued to lend to the smaller borrowers even though, according to the involuntary lending explanation, there may have been less incentive to do so because exposure to these borrowers was small. A recent study by Gluck (1987) supports this view. He found that as the creditworthiness of selected LDCs improved in the years after the debt crisis, they were able to obtain bond financing and forego bank loans as a source of funds.

Folkerts-Landau (1985) and Edwards (1986) also provide some interesting evidence that is consistent with the relative advantage argument. They suggest that because banks are in a better position to reschedule and

renegotiate a borrower's obligations than are bondholders, whose primary recourse is declaring default on the obligation, risk premia on the two types of instruments should reflect these differences. Consistent with this hypothesis, they observe that default risk premia rose by substantially more on bonds than on bank loans after the onset of the debt crisis.

The relative advantage argument, then, suggests that once the debt crisis erupted and investors became more concerned about the probability of default on the part of at least some of the LDC debtors, one would expect to see an even greater preference for bank loans as opposed to bonds in those countries. As default risk increased, banks' superior ability to work with troubled debtors and ultimately, to seize assets, would have become more valuable to investors. This would explain why U.S. banks' exposure to troubled LDCs rose relative to their exposure to more creditworthy international borrowers. It also would explain why exposure became more concentrated at the nine largest banks. Since those banks are the ones most actively involved in the international payments network and in trade finance, they are also the banks best able to monitor and seize assets if necessary.

Moreover, in workout situations, lenders need to act cohesively and the fewer lenders there are, the easier it would be to achieve consensus. This view suggests first that bond finance is particularly unsuited to workout situations since it is unlikely that the myriad bondholders could be forced to work cohesively. It also suggests that the banks with the largest exposures to begin with (that is, the nine money center banks) would have had the greatest incentive to work cohesively and to continue lending to the troubled debtors.

Subsidy Factor

A second and possibly more important factor that may have induced banks to continue lending to troubled LDCs is the existence of regulatory incentives or subsidies. In general, government subsidies, either of the lender's assets or its liabilities, will distort decisions regarding risk. If the government were to underwrite at least a portion of the increased risk, lenders would have an incentive to make and hold riskier loans than they otherwise would.

These subsidies can arise in two ways. First, the government (or a multilateral official institution such as the IMF) may subsidize exposure to LDCs *directly* by providing a guarantee of the loans to LDCs. With a guarantee of this sort, the guarantor would repay the lender up to the face value of the guarantee in the event of default by the LDC debtor. Clearly, such guarantees will encourage banks to make and hold LDC debt because some or all of the increased risk is borne by the guarantor (that is, the government) and not the lender.

Of course, there have been no public pronouncements that provide unequivocal evidence of the existence of such guarantees. Sachs (1987), however, maintains that loan guarantees were an explicit part of the negotiations involving rescheduled debt.[19] Moreover, a number of other studies have argued that bank managers and investors behaved as if *implicit* guarantees existed, in part because there are clear public policy goals served by lending to LDCs. For example, Folkerts-Landau (1985) argues that the governments of the major industrial countries informally encouraged banks to lend to developing countries on the implicit understanding that the central banks would fulfill a lender-of-last-resort function if necessary.[20] Likewise, Guttentag and Herring (1985) suggest that one reason that banks allowed exposure to LDCs to become so high may be the existence of official international support for developing countries through such programs as the IMF's adjustment assistance programs.[21]

In contrast, there is little evidence that direct guarantees, whether explicit or implicit, were available for bonded debt. If guarantees were to apply only to bank loans, this would explain the willingness of bank lenders to continue lending while bondholders became more reluctant after the crisis.

A second way that the government could have subsidized lending to LDCs is indirectly — through (underpriced) guarantees of banks' liabilities. Of course, such subsidies are not available to bondholders. This sort of deposit insurance subsidy increases banks' willingness to hold risky assets generally. Since lending to LDCs was considered riskier than lending to industrial countries even prior to the debt crisis, banks would have had incentives to increase their exposure to LDC borrowers, particularly as the demand for external funds apparently increased throughout the 1970s. This could explain why a very large share of the private lending to LDCs even prior to the crisis took the form of bank loans as opposed to bonds.

Once the debt crisis erupted, the response of bank share prices and of new bank lending to troubled LDCs would have depended on the nature of the subsidy. Direct subsidies in the form of loan guarantees likely would have had less impact on stock prices and lending behavior than indirect subsidies. Specifically, with direct subsidies, one would not expect bank share values nor secondary market values of outstanding LDC loans to decline since the guarantor would have been the one to bear the losses.

The actual decline in share values and secondary market prices after the crisis suggests either that direct subsidies were not a significant factor in banks' international lending decisions, or that investors and bank managers were

unsure of the strength of such implicit subsidies. The fact that banks tended to view IMF assistance and involvement in the rescheduling of a troubled country's debt as a prerequisite for providing new funds to that country may be a reflection of this uncertainty. Alternatively, Sachs has argued that banks have been willing to continue lending as a *quid pro quo* for IMF protection with respect to outstanding obligations.[22]

Regardless of the significance of direct subsidies in banks' lending decisions, indirect subsidies (that is, subsidies associated with deposit insurance protection) almost certainly played an important role. There is a large and growing body of evidence on the so-called deposit insurance problem which suggests that indirect subsidies exert a strong influence on banks' domestic lending. Foreign lending should be no different in this regard. Moreover, the declines in bank share prices and secondary market prices for LDC loans are both consistent with this type of subsidy. Unlike direct subsidies, in the event of default, bank shareholders do bear the risk of loss with indirect subsidies even though insured depositors do not.

Also, banks' willingness to continue lending to troubled LDCs after the crisis is consistent with the view that indirect subsidies were a significant factor in lending decisions. For example, one could argue, as Furlong and Keeley (1987) have, that a lender's incentive to hold risky assets increases the closer the lender is to insolvency. Thus, the decline in the market value of banks' net worth following the debt crisis probably provided banks with an *additional* incentive to maintain their exposure to the riskier LDCs.

Finally, the regulatory accounting treatment of rescheduled and nonaccruing LDC debt also is consistent with the existence of indirect subsidies. Regulators have allowed banks to record most LDC loans at book value as long as there is some "reasonable" prospect that the bank will be repaid at least its principal investment. As a result, banks have not had to record capital losses for LDC loans even though the market value of LDC loans declined precipitously following the 1982 crisis. By allowing this sort of indirect subsidy through "capital forbearance," bank regulators may have provided some additional inducements to continue lending. (Of course, regulators have required banks to improve their book value capital-to-assets ratios since then, so the forbearance may not have been as great as it might have first appeared.)

In sum, subsidies of various sorts probably help to explain why U.S. banks' exposure to developing countries reached such a high level in the 1970s. Once the debt crisis erupted, uncertainty over how the regulators would respond to the increased possibility of default probably also helps to explain why bank share values subsequently declined and why banks reduced their new lending to troubled LDCs. Moreover, the apparent tendency for banks to keep the riskiest debt may be consistent with this view, particularly if the regulators' actions over time could be interpreted as providing assurances of willingness to forbear.

However, the existence of subsidies does not necessarily explain why seemingly only the nine largest banks could take advantage of them, unless the subsidies were directed at a group of banks considered, by both the regulators and the market, as too large to be allowed to fail. Otherwise, subsidies would have been perceived to extend to other large banks as well, if not also to the smaller banks.

Assessment

The available evidence on lending to LDCs cannot clearly distinguish among the three explanations: the involuntary lending argument, the efficiency factor, and the subsidy factor. More sophisticated tests might shed some light and, in fact, work in progress by James suggests that indirect deposit subsidies have had a lot to do with LDC lending.

However, it is likely that all three influences have been operating since they are not mutually exclusive and may even be complementary. For example, part of the reason that the governments of industrial countries may have chosen to provide protection for bank loans to LDCs may have been that, in the event of a crisis, bank lenders have a relative advantage in monitoring the borrower and in handling a problem loan workout. Moreover, multilateral organizations like the IMF may have encouraged continued lending and helped to enforce fair-share rules because the amount of funds provided otherwise would have been inadequate. Thus, the three influences could have been and probably were mutually reinforcing.

V. Summary and Policy Implications

Mexico's announcement in August 1982 had a profound impact on the market's assessment of the default probabilities associated with lending to developing countries. Specifically, default risk premia increased and the holders of existing debt suffered large market value capital losses. As a result, lenders have become less willing to extend new loans to the countries perceived as most risky. Moreover, the outstanding exposure of U.S. banks has declined through actual write-offs, repayments, and, primarily, through growth in capital accounts.

The decline in exposure to troubled LDCs, however, is not very dramatic when compared to the declines in exposure to more creditworthy international borrowers. Likewise, the largest U.S. banks now have a larger share of troubled LDC exposure than when the debt crisis erupted. This paper has posited a number of possible explanations, all of which imply that after 1982 investors developed a decided preference for holding the obligations of troubled LDCs in the form of bank loans as opposed to bonds.

Previously cited work by James suggests that indirect subsidies have played a significant role in keeping U.S. banks' exposure to the riskiest developing countries high. Consequently, bank regulators must continue to monitor these exposures carefully and encourage banks to continue to raise capital to prevent further distortions in international lending decisions.

At the same time, however, bank lending to troubled LDCs also may be a reflection of the superior monitoring capabilities banks have in working with problem debtors. As a result, the true value of these loans on banks' books may lie somewhere between their book values and their values to nonbank investors on the secondary market. Such considerations are important to proposals that would require banks either to mark their LDC loan portfolios to market and/or to hold substantially more book capital.

APPENDIX A

International Banking

List of Country Groups

G-10 Plus Switzerland

Switzerland	Germany	Canada	Sweden
Italy	United States	France	United Kingdom
Belgium-Luxembourg	Japan	Netherlands	

Non-G-10 Developed Countries

Australia	Ireland	New Zealand	Norway
Austria	Spain	Denmark	Portugal
Finland	Greece	Iceland	Turkey

OPEC LDCs

Bahrain	Kuwait	Brunei	Iraq
Oman	Nigeria	Trinidad & Tobago	Libya
Algeria	Saudi Arabia	Ecuador	Qatar
Gabon	Venezuela	Indonesia	United Arab Emirates
Iran			

Non-OPEC Developing Countries, Troubled Debtors

Argentina	Liberia	Bahamas	Jamaica
Barbados	Malawi	Bermuda	Madagascar
Bolivia	Morocco	Brazil	Mexico
Chile	Panama	Columbia	Nicaragua
Costa Rica	Peru	Cuba	Paraguay
Dominican Republic	Senegal	El Salvador	Philippines
Guatemala	Uruguay	Guyana	Sudan
Haiti	Zambia	Honduras	Zaire
Ivory Coast			

Non-OPEC Developing Countries, Nontroubled Debtors

Angola	Mauritius	Antigua	Mozambique
Botswana	Nauru	Burma	Nepal
Burundi	North Korea	Cameroon	Netherlands-Antilles
China PR	Pakistan	Congo	Papua New Guinea
Cyprus	Puerto Rico	Egypt	Singapore
Ethiopia	Solomon Islands	Fiji	South Korea
Ghana	Sri Lanka	Guinea	Swaziland
Hong Kong	Syria	India	Taiwan
Israel	Tanzania	Jordan	Upper Volta
Kenya	Vietnam	Lebanon	Yemen
Lesotho	Yugoslavia	Macao	Zimbabwe
Malaysia		Mauritania	

Baker's List of 15 Largest LDCs with Debt Servicing Problems

Brazil	Philippines	Morocco	Ivory Coast
Mexico	Chile	Colombia	Uruguay
Argentina	Yugoslavia	Peru	Bolivia
Venezuela	Nigeria	Ecuador	

FOOTNOTES

1. See Sachs (1987) for a more complete description of the rescheduling arrangements.

2. Cited in Kyle and Sachs (1984).

3. In addition, the average (for all rated countries) country risk rating published by *Institutional Investor* fell from 52.3 to 41.0 between 1980 and 1983.

4. There are a number of other studies on the impact of LDC exposure on bank share prices. See, for example, Smirlock and Kaufold (1987) and Cornell and Shapiro (1986).

5. The data on external funds raised in international markets come from the OECD's *Financial Statistics Monthly*. All data are reported in U.S. dollars and are converted on the basis of the average spot rate for the month the bonds or loans were reported. For this paper, we use year-end figures that reflect the sum of all new lending, including bond financing over the year. It should be noted, however, that these figures represent total funds raised, including reschedulings and refinancings, as opposed to net new funds raised.

6. Morgan Guaranty Trust Company, *World Financial Markets*, June/July 1987.

7. Rodney Mills, "Foreign Lending by Banks: A Guide to International and U.S. Statistics," *Federal Reserve Bulletin*, October 1986.

8. It should be noted, however, that this increase in loan loss reserves also is the result of anticipated loan losses arising from banks' domestic loan portfolios at this time.

9. Data on U.S. banks' international loan exposure come from the Federal Reserve Board's *Country Exposure Lending Survey* (CELS). This survey was first conducted in 1977 in response to a perceived need for better data on the cross-border claims of consolidated banking organizations domiciled in the U.S. with foreign branches and majority-owned foreign subsidiaries. The data are now collected on a quarterly basis. U.S. bank exposure to over one hundred countries and a number of international organizations are reported by type of borrower and time remaining to maturity, with adjustments for loan guarantees that shift exposure across countries.

CELS data are reported for three subsets of banks: the nine money center banks, the next 14 largest banks, and the remaining banks with at least $30 million in consolidated claims on non-U.S. residents and that have at least one foreign branch or foreign subsidiary (about 160 in number).

The major drawbacks of these data are that they do not cover the claims held by all U.S. banks and the country-by-country breakdown only covers exposures that exceed three-fourths of one percent of a reporting bank's capital. Also, CELS data do not cover local-currency-denominated claims.

10. Reported in Sachs (1987), cited above.

11. Krugman (1985) and Sachs (1984) have developed models that show once a sovereign borrower has run into debt problems, it may be in the interests of all the lenders involved to reschedule the outstanding obligation and extend additional funds to reduce the borrower's near-term debt burden and enhance long-term repayment prospects. However, because there is a public good aspect to new lending in that the value of any given lender's outstanding exposure will be enhanced whether or not that lender participates in providing new funds, the lenders with the smallest exposures will have an incentive to "free ride" on the new lending of the others.

12. The Spearman Rank Test showed that correlation between the *Institutional Investor* rating and the loan discount for a given country was 0.843, at a significance level of 0.0001.

13. OECD, *Financial Statistics Monthly*.

14. There may be other factors, as well. For example, Guttentag and Herring (1985) argue that bank lending to developing countries can be explained by a concept drawn from current research in cognitive psychology called "disaster myopia." However, because this view has not gained wide acceptance in the literature, it is not addressed in this article.

15. Berlin and Loeys (1986), James (forthcoming) and implicit in Folkerts-Landau (1985).

16. These covenants typically require the borrower to meet certain readily observed conditions which, presumably, are good indicators of the borrower's true net worth. These conditions include among other things, restrictions on the types of assets the borrower may invest in, the maintenance of certain financial ratios, and the maintenance of a minimum level of capital adequacy. Violations of these covenants imply that the borrower is close to insolvency, giving bondholders the right to accelerate the maturity of their claim even to the point of forcing liquidation of the borrower's assets in bankruptcy.

17. For example, the growth in the commercial paper market largely is due to the ability of larger, well-established borrowers to raise funds directly at a lower cost than through bank loans.

18. See Niehans (1985) and Glick (1986).

19. Sachs (1987), p. 21.

20. Folkerts-Landau (1985), p. 324.

21. Guttentag and Herring (1985), p. 136.

22. Sachs (1987), p. 21.

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