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Official Credits to Developing Countries: Implicit Transfers to the Banks

TWO MAIN TYPES OF EVENTS have affected returns of banks that are heavily exposed to developing country debt during the 1980s: actions by the debtor countries, for example, moratoriums, and creditor country actions such as changes in bank regulations and in the availability of official monies to the debtor countries. The effects of the first type of events on bank stock prices have been investigated extensively. In particular, Schroder and Vankudre (1986), Cornell and Shapiro (1986), Bruner and Simms (1987), and Smirlock and Kaufold (1987) examine the effect of Mexico's 1982 default. Sachs and Huizinga (1987) and Musumeci and Sinkey (1990) study the effect of Brazil's debt moratorium in 1987. Ozler (1989), finally, investigates the impact of 1978–1983 international loan reschedulings on bank stock values.

Fewer studies have analyzed the effect of official creditor country actions on bank stock returns. Changes in regulations governing bank operations are examined by Eyssell, Fraser, and Rangan (1989). The effect of official monies, more specifically of indirect provisions made available as increases in resources of international financial institutions, has been studied by Cornell, Landsman, and Shapiro (1988) and Billingsley and Lamy (1988). They show that the 1983 increase in the U.S. quota to the IMF by $8.5 billion materially affected bank stock returns. However, official monies provided directly as loans to debtor nations are also important. For instance, earlier in 1982 and in 1983 the IMF provided a series of large balance of payments loans to Argentina, Brazil, Chile, and Mexico that similarly could be expected to

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have affected bank stock returns. More recently, as part of the Brady Plan, the IMF and World Bank have earmarked around $24 billion for developing country debt reduction. This paper investigates to what extent these official monies made available to debtor countries have devolved to the banks, as reflected in their stock market prices.

For several episodes, we calculate the increase in expected repayment by debtor nations reflected in bank stock prices. Stock market prices are found to have responded strongly to the announcements of large IMF loans to Latin American debtors in late 1982 and to a lesser extent in early 1983. In the period from 1984 to 1988, we find no clear repercussions for bank stock prices of announcements of large commitments by the IMF, World Bank, or national governments. Apparently, the stock market went through a learning process early in the debt crisis after which a pattern of large multilateral balance of payments loans to be partly used for private debt service was clearly established.

In March 1983 the United States approved an increase in its quota to the IMF by $8.5 billion. As the U.S. quota share in the IMF is 19.6 percent, this approval effectively released a total of $43.4 billion, of which about $6 billion is estimated to have accrued to private banks worldwide. The recent World Bank quota increase of $74.8 billion in 1988, however, did not clearly affect bank stock returns at its passage as the increase had been fully anticipated. The IMF quota increase of around $60 billion announced in May 1990 interestingly affected bank stock returns negatively. This is due to the fact that the market expected a greater increase whereas the United States was able to prevent the quota subscriptions from increasing by more than 50 percent.

In the case of the Brady Plan, the paper abstracts from the details of the menu by which debt reduction actually takes place that can be important to the banks as shown by Demirgüç-Kunt and Diwan (1990). While the initial reaction to the debt reduction plan was unclear, during the period of March 16 to March 20 when the extensive IMF and World Bank involvement in debt reduction was secured, bank returns showed a significantly positive reaction. Interestingly, heavily exposed banks seem to have benefitted less per dollar of developing country debt than the lowly exposed banks, although for both types of banks debt repayment prospects should have been affected equally. Heavily exposed banks may have benefitted less, as their contingent claim on the Federal Deposit Insurance Corporation (FDIC) was reduced as repayment prospects improved.[1] Judging from the lowly exposed banks only, the $24 billion made available for debt reduction appears to have increased the present value of debt payment by $22.4 billion. This result is consistent with Bulow and Rogoff (1988) who have shown that the Bolivian debt buyback of 1988 mainly benefitted the banks. Of course, debt reduction is not necessarily a zero-sum game and a debtor country can also benefit from debt reduction, as disincentives for in-

1. Consistent with this explanation, Ozler and Huizinga (1990) have shown that the relationship between a bank's developing country exposure and bank valuation due to federal deposit insurance is nonlinear in the sense that the replacement of one dollar of cash by one dollar of developing country exposure reduces bank market capitalization less for a highly exposed bank than for a lowly exposed bank.

vestment stemming from a debt overhang are reduced. The paper does not estimate the benefits of debt reduction accruing to the debtor country, although the recent economic performance by Mexico after its Brady-style debt reduction suggests these benefits can be large. Comparing the experience of the lowly and highly exposed banks, we estimate that the U.S. banks' contingent claim on the FDIC has been reduced by approximately $9 billion.

The remainder of this paper is as follows. Section 1 describes the empirical methodology and the data. Section 2 discusses the events and presents the main results. Section 3 concludes.

1. METHODOLOGY

The main aim of the analysis is to infer from bank stock prices the transfer to the commercial banks implicit in the provision of official monies to the debtor nations. To start, let us consider the following bank valuation equation:

$$MV_i = LDC_i + NLDC_i + NB_i - LI_i \tag{1}$$

where MV_i is the market value for bank i, LDC_i is the present value of the expected developing country debt repayment, $NLDC_i$ is the market value of the bank's non-LDC assets, NB_i is the value of the bank's off-balance-sheet items (and in particular its contingent claim on the FDIC), and LI_i is the value of bank liabilities. MV_i is measured as the common stock price times the number of shares outstanding.[2]

Now let the official creditor make available resources L_j to country j. L_j can be a direct loan to country j or an indirect transfer of resources to a multilateral agency to be channeled to country j at a later point. For bank i, this transaction affects expected debt repayment LDC_{ij} and the contingent claim NB_i. From (1) we can derive

$$\frac{dP_i}{P_i} = [\delta + \epsilon_i] \frac{E_{ij} dL_j}{MV_i \sum_i E_{ij}} \tag{2}$$

where P_i is the stock price, $\delta = \dfrac{d \sum_i LDC_{ij}}{dL_j}$ and $\epsilon_i = \dfrac{dNB_i}{dL_j} \dfrac{\sum_i E_{ij}}{E_{ij}}$, and E_{ij} denotes the exposure of bank i to country j.

The coefficient δ in (2) measures the proportion of the official resources that is expected to be transferred to the banks. All banks are expected to be repaid by debtor countries in proportion to their exposure, that is, $\dfrac{LDC_{ij}}{\sum_i LDC_{ij}} = \dfrac{E_{ij}}{\sum_i E_{ij}}$, as

2. Preferred stock is taken to be a part of liabilities.

TABLE 1

LIST OF EXPOSED AND NONEXPOSED BANKS

Highly Exposed Banks	EXP/MV	EXP/BV
(1) Manufacturers Hanover	418.8	212.7
(2) Chase Manhattan	239.7	145.4
(3) Chemical Bank	215.6	142.0
(4) BankAmerica Corp.	180.9	173.1
(5) Continental Bank Corp.	154.7	136.0
(6) Citicorp	101.7	101.5
(7) Bankers Trust NY	100.3	81.4
(8) First Chicago	87.7	83.1
(9) J.P. Morgan Co.	59.3	67.7
(10) First Pennsylvania Corp.	56.2	106.6
(11) Bank of New York	56.2	55.7
Lowly Exposed Banks	**EXP/MV**	**EXP/BV**
(12) Southeast Banking Corp.	30.0	33.2
(13) Republic NY Corp.	28.8	33.3
(14) Northern Trust Corp.	25.2	26.6
(15) Bank of Boston Corp.	18.2	15.9
(16) Manufactures National	15.3	17.9
(17) Security Pacific	12.8	14.7
(18) Wells Fargo & Co.	12.1	17.7
(19) NBD Bancorp	8.9	10.5
(20) Midatlantic Corp.	3.5	3.7
(21) NCNB Corp.	0.2	0.3
Nonexposed Banks	**EXP/MV**	**EXP/BV**
(22) Dominion Bankshares	0.0	0.0
(23) First Alabama Bankshares Inc.	0.0	0.0
(24) Crestar Financial Corp.	0.0	0.0
(25) Baybanks Inc.	0.0	0.0
(26) U.S. Trust Corp.	0.0	0.0
(27) State Street Boston Corp.	0.0	0.0
(28) Citizens and Southern	0.0	0.0
(29) Barnett Banks Inc.	0.0	0.0
(30) First Virginia Banks Inc.	0.0	0.0

NOTES: EXP/MV and EXP/BV are LDC exposures as percentages of the market and book values of bank capital respectively. LDC exposure is exposure to Argentina, Brazil, Chile, Mexico, and Venezuela. All data are as of December 30, 1988. Numbers in parentheses correspond to bank numbers in Tables 3–6.

is consistent with nondiscrimination clauses in syndicated loan contracts. The coefficient ϵ_i measures the indirect effect of official transfers to debtor nations on banks' claims on the FDIC. For a lowly exposed bank, ϵ_i will be close to zero while for highly exposed banks ϵ_i may be substantially negative. As for each bank $\delta + \epsilon_i$ is estimated jointly, values of ϵ_i for highly exposed banks can be inferred by comparing their estimates of $\delta + \epsilon_i$ to those of lowly exposed banks.

Our sample of banks consists of roughly twenty-one exposed and nine nonexposed U.S. banks, depending on the particular event. A list of banks is given in Table 1.[3] As shown, exposed banks are grouped as highly and lowly exposed banks based on their exposures relative to market or book values of their capital. Individual banks' exposure data for individual countries is obtained from the Country Expo-

3. The exposed banks are all fairly large banks. Few, if any, of these banks will be liquidated in case of a bank failure. Hence, for these banks de facto deposit insurance may extend to all deposits.

sure Lending Surveys published by the Federal Financial Institutions Examination Council, Washington, D.C. Data on daily bank and overall market returns, for the period January 1, 1983, to December 31, 1989, are obtained from the tapes of the Center for Research in Security Prices (CRSP) at the University of Chicago. The market return is the dividend inclusive return of the S&P 500 index.

Following Smirlock and Kaufold (1987) and Eyssell, Fraser, and Rangan (1989), the following set of n linear equations is estimated first:

$$\begin{aligned} R_{1t} &= \alpha_1 + \beta_1 R_{mt} + \gamma_{d1} D_t + e_{1t} , \\ R_{2t} &= \alpha_2 + \beta_2 R_{mt} + \gamma_{d2} D_t + e_{2t} , \\ R_{nt} &= \alpha_n + \beta_n R_{mt} + \gamma_{dn} D_t + e_{nt} , \end{aligned} \tag{3}$$

where R_{it} is the return on the stock of bank i on day t. R_{mt} is the market return, D_t is a dummy equal to 1 during the event period of three days including the day before and after the event, and zero otherwise.[4] The system is estimated for each year, using daily returns. Event dummies for separate events during one year are included.

For the set of exposed banks only, the following alternative system is estimated:

$$\begin{aligned} R_{1t} &= \alpha_1 + \beta_1 R_{mt} + \gamma_{e1} D_t E_{1t} + e_{1t} , \\ R_{2t} &= \alpha_2 + \beta_2 R_{mt} + \gamma_{e2} D_t E_{2t} + e_{2t} , \\ R_{nt} &= \alpha_n + \beta_n R_{mt} + \gamma_{en} D_t E_{nt} + e_{nt} , \end{aligned} \tag{4}$$

where $\gamma_{ei} = \delta + \epsilon_i$ and E_{it} is $\dfrac{E_{ij,t} dL_j}{MV_i \sum_i E_{ij,t}}$ given a change in official resources dL_j.

The systems are estimated using the seemingly unrelated regressions (SUR) technique, which allows for contemporaneously correlated disturbances.[5] This technique is most appropriate for estimation of a system of equations that have nonzero correlations across their residual terms due to implicit relationships. In the above system implicit cross-equation relationships exist since all banks are members of the same industry.

The two types of hypotheses to be estimated are

H_1: The sets of event parameters, γ_{di} or γ_{ei}, are zero for a group of banks.
H_2: The sets of event parameters, γ_{di} or γ_{ei}, are equal to each other for a group of banks.

4. Using the same dummy variable for multiple days is to capture leakages and lags of information, and is common in event studies. See for instance, Eyssell, Fraser, and Rangan (1989), and Grammatikos and Saunders (1990).

5. See Zellner (1962) for a discussion of the technique.

The groups of banks we consider are the set of exposed banks, the set of nonexposed banks, and all banks together. Hypotheses are tested separately for the three groups of banks.

For system (3), we expect the event parameters, γ_{di}, as a group to be different from zero for the exposed banks and for all banks together while the parameters should be zero (and equal to each other) for the nonexposed banks. If the event parameters for the nonexposed banks are different from zero, this indicates investors cannot correctly distinguish between exposed and nonexposed banks, which is a form of pricing contagion. Also, if the event parameters for the exposed banks are equal to each other, this points at contagion, as it implies stock market investors cannot distinguish between heavily and lowly exposed banks.

For system (4), we again expect the event parameters γ_{ei} to be significantly different from zero for the group of heavily exposed banks and for all banks. The event parameters should be equal to each other if $\epsilon_i = 0$ for all banks, that is, if insurance provided by the FDIC does not affect bank valuation. If the hypothesis of equal event parameters is rejected for the heavily exposed or for all banks, this points to (i) investor contagion or (ii) a significant relationship between the ϵ_is and the E_is. A negative correlation between the ϵ_is and E_is, in particular, suggests the FDIC claim in bank valuation is important.

2. EVENTS AND FINDINGS

a. IMF Loans in 1982 and 1983

The announcement dates of the events that are examined are reported in Table 2. The first five dates represent news concerning large IMF loans to Latin debtor countries in late 1982 and early 1983. The first of these, in October 1982, was a $2 billion loan to Argentina. The loan came at a time that Argentina had $1.7 billion in arrears on $40 billion of debt, and just two months after Mexico declared its inability to service its debt in August 1982. As reported in the Wall Street Journal (10/29/82), upon hearing the news a banker said, "This is much the best news we have had in one of the bleakest years I can remember."

Subsequently the IMF reached agreements on large loans to Brazil, Mexico, and Chile in December 1982 and the first two months of 1983. The loan to Brazil was tentatively agreed to in December 1982, and formally approved in February 1983. These large loans, unlike some smaller loans from the multilateral lending agencies, are not earmarked to finance specific projects, and thus the funds are generally available for debt service. Regulations requiring banks to disclose their developing country exposures in the 10Q and 10K reports were not revealed till October 1982.[6] Thus during this period bank stock investors had very incomplete information about individual bank exposure, and we cannot estimate system (4). Estimation of system (3)

6. The 10Q and 10K reports are quarterly and annual reports that banks file with the Securities Exchange Commission and that are subsequently made public.

TABLE 2

DATES AND EVENTS

Date	Event
October 28, 1982	IMF tentatively arranges $2.0 billion in assistance for Argentina.
December 15, 1982	IMF reaches tentative agreement to provide about $4.9 billion in loans to Brazil.
December 23, 1982	IMF formally approves $4.0 billion loan to Mexico.
January 10, 1983	IMF approves $882.5 million in loans to Chile.
February 28, 1983	IMF approves $5.5 billion in loans to Brazil.
March 7, 1983	Proposal to increase U.S. quota to IMF by $8.5 billion introduced in U.S. Senate.
February 16, 1988	World Bank Executive Directors agree on a $74.8 billion general capital increase.
December 15–20, 1988	World Bank proposes commercial banks with heavy exposure reduce debt. Mexico seeks debt restructuring.
March 10, 1989	Details of the debt reduction plan are announced. Banks will be asked to forgive some of their debts. The percentage of debt to be forgiven is uncertain although rumors center around 30 percent.
March 17, 1989	Additional details concerning debt reduction are announced. The Treasury proposes reduction of bank debt through conversion into bonds that have principal and interest guarantees by the World Bank and the IMF.
May 6, 1990	G–7 endorse 50 percent increase in IMF quotas.
May 7, 1990	IMF policy-making committee increases the institution's resources by 50 percent from about $120 billion to roughly $180 billion.

for the case of the loan to Argentina is reported in Table 3. Fourteen of the eighteen exposed banks are shown to have a positive return during the three-day event period, with significant coefficient γ_{di} for two banks. The hypotheses that event parameters are zero are rejected for the exposed banks, and for all banks together, but only at 10 percent level for the nonexposed banks.

The hypothesis that the event parameters are equal is rejected for all the three groups of banks. The means for the event parameters of the heavily and lowly exposed banks are 0.88 and 0.52 percents respectively, suggesting that some information about individual bank exposure was known to investors.

Bank investor response to the agreement between Brazil and the IMF in December 1982 was much less favorable. During the event period, sixteen of the eighteen banks experienced negative excess returns. The hypothesis of zero event parameters is rejected at the 5 percent level for all banks, but only at the 10 percent level for the exposed banks. Apparently, stock market investors had anticipated a slightly more favorable loan. Also, for the announcement of the large IMF loan to Mexico in December 1982, we find that the hypothesis of zero event parameters cannot be rejected.

Another loan in this sequence, to Chile, was approved on January 10, 1983. According to the Wall Street Journal (1/4/83), there was considerable doubt whether this loan would be approved. The results of Table 3 show that at the time of announcement three exposed banks experienced significantly positive excess returns. However, the hypothesis of zero event parameters is not rejected for all banks, and only at the 10

TABLE 3

LARGE IMF COMMITMENTS TO LATIN DEBTORS IN 1982 AND 1983

Event Dates: Bank	α_i	β_i	10-28-82 γ_{di}	12-15-82 γ_{di}	12-23-82 γ_{di}
1	0.0002	0.91	0.0040	0.001	
2	−0.0006	1.02	0.0040	0.001	
3	0.0002	0.79	0.0060	−0.002	
4	−0.0005	1.14	0.0080	−0.009	
5	0.0003	0.81	0.0020	−0.005	
6	0.0006	1.45	−0.0090	−0.006	
7	0.0004	1.00	−0.0080	−0.024*	
8	−0.0001	1.03	0.0060	−0.021#	
9	0.0007	0.89	0.0001	−0.008	
10	0.0010	0.56	0.0850*	−0.002	
11	0.0005	0.55	−0.0004	−0.003	
12	0.0009	0.19	0.0010	−0.012	
13	−0.0001	0.56	0.0010	−0.009	
14	0.0010	0.22	−0.0010	−0.000	
15	0.0005	0.48	0.0280*	−0.007	
16	0.0010	0.87	0.0020	−0.026*	
17	−0.0002	0.71	0.0020	−0.020*	
18	0.0001	0.80	0.0040	−0.014	
$HYP1_e$			1.59*	1.47#	0.91
$HYP2_e$			1.66*	1.25	0.93
22	−0.0003	0.27	0.0070	−0.0150*	
23	−0.0001	0.19	0.0001	0.0006	
24	0.0008	0.22	0.0010	0.0010	
25	0.0006	0.24	0.0080	0.0040	
26	0.0010	0.20	−0.0030	−0.0020	
27	0.0020	0.34	−0.0030	0.0060	
28	0.0010	0.08	−0.0050	0.0007	
29	0.0003	0.45	0.0280*	−0.0150	
30	0.0010	0.40	0.0110	0.0070	
$HYP1_{ne}$			1.72#	1.36	0.61
$HYP2_{ne}$			1.93*	1.53	0.69
$HYP1_a$			1.68*	1.48*	1.01
$HYP2_a$			1.73*	1.48*	1.05

Event Dates:			1-10-83			2-28-83
Bank	α_i	β_i	γ_{di}	γ_{ei}	γ_{di}	γ_{ei}
1	−0.0009	0.99	0.0180*	0.1100*		
2	−0.0008	1.11	−0.0010	0.0080		
3	−0.0003	0.94	0.0006	0.0008		
4	−0.0003	1.05	0.0180*	0.2700*		
5	−0.0008	1.02	−0.0080	−0.1300		
6	−0.0004	1.50	0.0100	0.1600		
7	0.0004	1.17	0.0008	0.0100		
8	0.0005	1.48	−0.0110	−0.1800		
9	−0.0005	0.82	0.0050	0.1200		
10	0.0010	1.08	−0.0110	−0.0900		
11	0.0010	0.48	−0.0040	−0.1000		
13	−0.0003	0.49	−0.0010	−0.0200		
15	0.0001	0.76	0.0200*	0.7200*		
17	0.0010	0.74	−0.0060	−0.2000		
18	0.0010	0.87	−0.0070	−0.1100		
19	0.0010	0.42	−0.0100*	−1.2100*		
20	0.0020	0.14	0.0090	0.6500		
21	0.0010	0.48	−0.0003	−0.0500		
$HYP1_e$			1.48#	1.58*	0.91	0.91
$HYP2_e$			1.54#	1.60*	0.92	0.72

(*continued*)

TABLE 3 (*Continued*)

Event Dates: Bank	α_i	β_i	10-28-82 γ_{di}	12-15-82 γ_{di}	12-23-82 γ_{di}
22	0.0010	0.41	−0.0030		
23	0.0010	0.31	−0.0010		
24	0.0010	0.10	−0.0080#		
25	0.0010	0.04	−0.0030		
26	0.0005	0.18	−0.0009		
27	−0.0030	0.56	−0.0030		
28	0.0020	0.23	0.0010		
29	0.0010	0.34	0.0030		
30	0.0010	0.56	0.0040		
$HYP1_{ne}$			0.41		0.58
$HYP2_{ne}$			0.38		0.59
$HYP1_a$			1.15		0.93
$HYP2_a$			1.19		0.96

NOTES: * and # indicate significance at 5 and 10 percent levels respectively. Significance levels for market parameters α_i and β_i are not reported. Hypothesis 1 tests whether all coefficients are equal to zero and hypothesis 2 tests whether they are all equal to each other. Subscripts *e*, *ne*, and *a* refer to tests for the groups of exposed, nonexposed, and all banks, respectively. *F* values are reported. For bank names see Table 1. For description of events corresponding to dates given, see Table 2.

percent level for exposed banks. Also, the IMF approval of a large loan to Brazil in February 1983 did not affect bank stock returns significantly.

The results suggest that the stock market, after the initial large IMF commitment to Argentina, anticipated that large commitments to other indebted countries would ensue, which explains the absence of strong stock market effects following announcements of later commitments. For subsequent announcements of large IMF and World Bank loans, such as the IMF commitment of $1.8 billion to Argentina in January 1987, and the simultaneous commitment by the World Bank of $2 billion to the same country, we similarly find insignificant stock market effects. These results are not reported.

b. Increase in U.S. Quota to IMF in 1983

In 1983 the United States passed legislation to increase its quota to the IMF by $8.5 billion. If as suggested above, IMF resources are in part used to enable debtor nations to pay off commercial bank debts, then an increase in U.S. funding to the IMF should positively affect bank shareholder wealth. Cornell, Landsman, and Shapiro (1986) previously found that at the passage of the bill to increase the U.S. quota in the U.S. Senate on June 8, 1983, bank stocks were negatively affected. Billingsley and Lamy (1988) show, however, that bank stocks were positively affected at the time the bill was introduced in the Senate on March 7, 1983, and that cumulative excess returns were positively related to the ratio of a bank's LDC exposure to bank assets plus loan-loss reserves. This specification does not allow one to estimate the increase in shareholder wealth.

The results of estimating systems (3) and (4), reported in Table 4, focus on the introduction of the proposal in the U.S. Senate. Six of the eighteen exposed banks experience positive excess returns, at least at the 10 percent significance level, indicating that the proposal was a surprise or at least that the proposed quota increase was greater than anticipated. The nonadjusted event parameters γ_{di} are significantly

TABLE 4

U.S. QUOTA INCREASE TO THE IMF PROPOSED IN 1983

Event Date:	3-7-83	
Bank	γ_{di}	γ_{ei}
1	0.0040	0.040
2	0.0190*	0.186*
3	0.0190*	0.187*
4	−0.0140#	−0.230#
5	0.0220*	0.386*
6	0.0100	0.178
7	0.0050	0.105
8	0.00170#	0.291#
9	0.0100#	0.271#
10	0.0110	0.130
11	0.0009	0.024
13	0.0220*	0.621*
15	0.0100	0.431
17	0.0110	0.404
18	0.0130	0.229
19	0.0090	0.696
20	−0.0010	−0.143
21	0.0040	0.553
$HYP1_e$	1.73*	1.73*
$HYP2_e$	1.44#	1.37
22	0.018*	
23	0.011#	
24	0.001	
25	0.023*	
26	0.005	
27	0.018*	
28	0.003	
29	−0.003	
30	0.015	
$HYP1_{ne}$	3.18*	
$HYP2_{ne}$	1.93*	
$HYP1_a$	2.17*	
$HYP2_a$	1.61*	

Notes as for Table 3. Estimates of the market model parameters α_i and β_i are not reported since they are not significantly different than those reported in Table 3.

different from zero for all banks, and the hypothesis that they are equal is rejected. Interestingly, the event parameters for the nonexposed banks as a group are also different from zero, and in fact three individual nonexposed banks have significantly positive returns. This points to contagion, where investors cannot distinguish between exposed and nonexposed banks. However, these results do not imply market inefficiency if the stockholders in fact did not have adequate information about individual bank exposures. Bank annual reports for the year 1982, published around March and April of 1983, were the first to contain obligatory reporting on individual bank exposure. The exposure-adjusted event parameters γ_{ei} are jointly different from zero, and the hypothesis that they are equal to each other cannot be rejected. This is strong evidence that stock investors indeed were aware of bank exposures.

The mean values of the exposure adjusted event parameters are equal to 0.142 and 0.398 for the sets of highly and lowly exposed banks respectively. This differ-

ence can be attributed to investor contagion, which causes investors to overprice the stock of lowly exposed banks on good news regarding developing country debt, or it may reflect the role of deposit insurance. Heavily exposed banks have a relatively large expected claim on the deposit insurance agency reflecting their riskier positions. Hence, as repayment prospects for LDC debt improve, the heavily exposed banks see their contingent claim on the FDIC decline in relative value. As a result, one expects the stock of heavily exposed banks to rise proportionally less on good news, even if markets are fully rational.

The estimated values of the exposure-adjusted event parameters γ_{ei} in Table 4 can now be used to estimate the increase in shareholder wealth during the estimation period. The estimated mean value of the exposure-adjusted event parameters is 0.242. This means that stockholders wealth was expected to increase by $6.2 billion, as there is a three-day event window and as the proposed quota increase was $8.5 billion. U.S. banks held roughly 24 percent of LDC debt at the time. This means that U.S. bank stocks rose by roughly $1.5 billion while foreign bank stock values rose by $4.7 billion.[7] As the U.S. share of bank exposure of 24 percent exceeds its IMF quota share of 19.6 percent, the United States gains relative to other nations from a proportional increase in the IMF quotas.

c. The Brady Plan

In March 1989, details of the Brady Plan were announced. As an important component, the IMF and the World Bank were to provide developing countries with funds for debt reduction. Debt reduction could take the form of debt buybacks or of the exchange of debt for exit bonds to be partly guaranteed by the multilateral institutions. As documented by Madura, Tucker, and Zarruk (1990), earlier announcements in December 1988 and January 1989 already suggested that official creditor policy would be reformulated toward debt reduction, but the generous support from the multilaterals announced in March 1989 appears to have been largely unexpected. Although initially (March 10) there was no significant market reaction, bank stocks reacted positively when support from multilaterals was unequivocably secured (March 17). The results of Table 5 indicate that eleven exposed banks experienced significantly positive excess returns on the latter date. Interestingly, the hypothesis that the nonadjusted event parameters γ_{di} are equal cannot be rejected. Indeed, the exposed banks appear to have very similar parameter estimates of around 0.02. Consequently, the hypothesis that exposure-adjusted event parameters γ_{ei} are equal is rejected. Apparently, the lowly exposed banks have benefited disproportionately to their exposure. This interpretation is confirmed by a negative correlation coefficient between the estimated parameter γ_{ei} and the exposure variable E_i of -0.54, which is significant at the 3 percent level.

Again, the different experiences of the highly and lowly exposed banks can be attributed to either contagion or to changes in the values of FDIC claims that differ

7. Statements about the non-U.S. banks are accurate to the extent that they are affected similarly by these events. Since we use only U.S. bank data, extending the results to non-U.S. banks worldwide is at best an approximation.

TABLE 5

BRADY PLAN ANNOUNCEMENTS OF MARCH 1989

Event Dates:			3-10-89		3-17-89	
Bank	α_i	β_i	γ_{di}	γ_{ei}	γ_{di}	γ_{ei}
1	−0.00040	1.16	0.0120	0.062	0.022*	0.122*
2	−0.00050	1.28	0.0130#	0.131#	0.015*	0.144#
3	−0.00150	1.39	0.0003	−0.007	0.027*	0.268*
4	−0.00005	1.56	−0.0030	−0.073	0.022*	0.282*
5	−0.00080	0.92	−0.0003	−0.013	0.004	0.106
6	−0.00100	2.12	0.0100	0.283	0.034*	0.776*
7	−0.00080	1.41	0.0100	0.243	0.023*	0.525*
8	−0.00030	1.17	0.0040	0.080	0.022*	0.585*
9	−0.00050	1.23	0.0040	0.279	0.028*	1.330*
10	−0.00050	0.51	−0.0040	−0.193	0.003	0.017
11	−0.00030	0.96	−0.0027	−0.270	0.004	−0.025
13	0.00030	0.40	0.0050	0.114	0.0006	0.590
15	−0.00100	1.05	0.0030	0.378	0.0130	1.860*
17	−0.00070	1.19	0.0070	1.490	0.0170*	3.330*
18	−0.00009	0.85	0.0070	1.500	0.0130*	2.840*
19	0.00010	1.09	−0.0030	−1.090	0.0060	2.170
$HYP1_e$			0.55	0.71	2.35*	2.96*
$HYP2_e$			0.55	0.75	1.50#	3.15*
22	0.00020	0.65	0.0030		−0.010	
23	0.00030	0.56	−0.0040		−0.006	
24	0.00070	0.42	−0.0060		−0.012*	
25	−0.00100	0.57	−0.0010		0.003	
26	−0.00005	0.16	−0.0020		0.001	
27	0.00090	0.70	−0.0003		−0.002	
29	−0.00080	1.15	−0.0006		0.005	
30	0.00070	0.46	−0.0040		−0.006	
$HYP1_{ne}$			0.24		1.00	
$HYP2_{ne}$			0.21		1.10	
$HYP1_a$			0.42		2.18*	
$HYP2_a$			0.44		1.94*	

Notes as for Table 3.

systematically with exposure across banks. If there is no contagion, then the mean event parameter estimate for γ_{ei} of 2.16 for the lowly exposed banks, and the $24 billion amount used for dL_j give us the estimate that expected repayment to banks rose by $155 billion. As contagion is ruled out to arrive at this estimate, it must be an upper limit. The $155 billion estimate roughly corresponds to 20 cents on the dollar for the entire $622 billion of commercial bank debt to developing countries outstanding at the end of 1989. 20 percent of course was the initial debt reduction aim of the Brady Plan.[8] The mean event parameter of 0.38 for the highly exposed banks, on the other hand, yields a low estimate of $27.4 billion in increased expected repayment to commercial banks worldwide. The estimate is a lower limit as it assumes no changes in the banks' claim on the FDIC.

U.S. commercial banks held around 14.5 percent of commercial bank debt to developing countries as of the first quarter of 1989. The low and high estimates of

8. Of course, significantly more than 20 percent of the debt of the Brady countries was identified for debt reduction. The total outstanding debt of developing countries to commercial banks is obtained from Table 5, *Quarterly Review,* World Bank, June 1990.

TABLE 6

WORLD BANK CAPITAL INCREASE OF FEBRUARY 1988

Event Date:			2-19-88	
Bank	α_i	β_i	γ_{di}	γ_{ei}
1	0.0003	1.03	0.0210*	0.031*
2	0.0050	1.10	0.0010	0.002
3	0.0010	1.19	−0.0040	−0.010
4	0.0030	1.06	−0.0130	−0.021
5	−0.0060	0.72	0.0030	0.007
6	0.0006	1.48	−0.0070	−0.040
7	0.0001	1.00	−0.0006	−0.004
8	0.0010	1.10	−0.0030	−0.020
9	−0.0006	1.19	0.0090	0.140
11	0.0010	0.58	0.0040	0.020
13	−0.0002	0.32	0.0090	0.270
15	−0.0003	1.19	−0.0030	−0.130
17	0.0015	0.80	−0.0170*	−0.770*
$HYP1_e$			1.90*	1.90*
$HYP2_e$			1.98*	1.83*
22	−0.00040	0.55	−0.0040	
23	0.00040	0.42	−0.0140*	
24	0.00030	0.40	−0.0060	
25	0.00050	0.36	−0.0080	
26	0.00003	0.16	0.0050	
27	0.00060	0.76	−0.0080	
29	0.00030	0.91	0.0007	
30	−0.00020	0.31	−0.0005	
$HYP1_{ne}$			0.84	
$HYP2_{ne}$			0.75	
$HYP1_a$			1.47#	
$HYP2_a$			1.54*	

Notes as for Table 3.

expected additional repayment to U.S. banks thus range from $4.0 to $22.4 billion.[9] The highly exposed banks own roughly half of the U.S. LDC debt. Thus an estimate of the reduction in expected FDIC payments to U.S. banks as a result of the Brady initiative is $9.2 billion. Again, this is a high estimate, as it rules out contagion.

d. Recent World Bank and IMF Quota Increases

In the last three years, both the World Bank and the IMF have obtained considerable quota subscription increases. On February 19, 1988, the World Bank was guaranteed a $74.8 billion general capital increase to be subscribed by member countries before September 30, 1993. On May 7, 1990, the IMF similarly obtained an increase in its resources of 50 percent, from around $120 billion to roughly $180 billion. These increases, unlike the U.S. increase of its IMF quota in 1983, resulted from lengthy reviews within the multilaterals and from negotiations between the principal member countries. Thus bank stock responses at the time of the final agreements are only relative to previous market expectations. Table 6 shows the results of estimating equations (3) and (4) for a three-day event period surrounding the

9. U.S. Commercial bank lending to developing countries as a percentage of total commercial bank lending is obtained from Tables 5 and 7A, *Quarterly Review,* World Bank, September 1989.

TABLE 7

THE IMF QUOTA SUBSCRIPTION INCREASE OF MAY 1990

Constant	EXP/MV		
0.016	−0.013	$R = 0.22$	$N = 24$
(2.48)	(−2.51)	$R = 0.19$	

NOTE: The dependent variable is the bank stock return on May 4, 1990. EXP/MV is bank's exposure to Argentina, Brazil, Chile, Mexico, and Venezuela divided by bank stock market capitalization.

announcement of the World Bank capital increase. A single highly exposed bank experienced a significantly positive excess return, and another lowly exposed bank experienced a significantly negative excess return. Evidently, the actual acceptance of the World Bank capital increase was not major unexpected news. Hypotheses that the event parameters for the exposed banks are zero or equal are both rejected.

The IMF quota increase of 50 percent was approved officially on Monday, May 7, 1990. However, the previous day the G-7 already released a communique endorsing the 50 percent increase. According to a later Wall Street Journal article (5/29/1989), this accord represented a victory for the United States which aimed to limit the increase in the IMF's capital. France and the IMF itself had sought a 100 percent increase. Hence, the passage of the accord can be expected to be negative news to the banks. Indeed, Table 7 shows that excess bank stock returns on Friday, May 4, were negatively related to the ratio of total bank exposure to five large Latin debtors to market capitalization. Apparently, news of the limited increase in IMF resources leaked to the market on the Friday before the final announcement. Using the estimate of −0.013 as an approximate coefficient for all banks, and given the three-day event period and the 1989 commercial bank exposure of $206.5 billion to the five large Latin debtors, one can compute that bank industry market capitalization worldwide was reduced by around $8.1 billion because of the limited increase in IMF resources. To the extent this news was previously discounted, this estimate is a lower estimate.

3. CONCLUSION

This paper has investigated the impact of the transfer of official resources to the debtor countries, in the form of official loans or increases in resources available to the multilateral lending agencies, on bank shareholder wealth. The main result, consistent with Bulow and Rogoff (1988), is that the stock market expects a significant share of additional resources provided to debtor countries to be used for debt service to commercial banks. In particular, bank stock market capitalization increased around $6 billion worldwide at the time of the 1983 U.S. proposal to increase its quota to the IMF by $8.5 billion. Similarly, bank shareholder wealth increased by a low estimate of $22.4 billion at the time details of the Brady Plan were recorded.

While the magnitudes of these estimated effects are informative, the emphasis should be on the direction of the effects as they are robust to overestimation problems. Clearly, the paper shows official resources provided to debtor countries do trickle down to creditor banks to some extent. However, the debtor countries them-

selves should at least gain from official monies provided for debt reduction insofar as the reduction of debt eliminates investment distortions stemming from a debt overhang. Our results reflect the fact that to a large extent monies provided by the multilaterals are either specifically earmarked for debt service, or are in the form of general balance-of-payments support that can be allocated to private debt service. Official creditor resources that are provided specifically to finance development projects should be expected to devolve to commercial banks to a lesser degree.

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