The Menu Approach to Developing Country External Debt

An Analysis of Commercial Banks' Choice Behavior

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Suppose that each creditor bank to a particular debtor country is confronted with a choice: each dollar of country debt held can be either rescheduled or sold at a given price. What choice will they make? Relatively strong banks will take advantage of a debt workout to exit from the debt. Relatively weak banks will relend.

Demirguc-Kunt and Diwan explore what determines tne choice banks will make when confronted with a "menu" of exit instruments and new-money options, as is now typical in debt workouts for developing countries.

In particular, they examine how deposit insurance and rules on capital adequacy affect a commercial bank's exit decision — arguing that these exit decisions are influenced mainly by the structure of the banks' balance sheets and by the regulatory systems within which they operate.

The FDIC insurance subsidy is more valuable to weak institutions, they argue, so a bank's valuation of the debt claims it holds is inversely related to the bank's financial strength. For a given menu, the relatively weak banks choose to relend.

The banks that choose to exit are those that are financially "strong" and have relatively high exposure to the country whose debt is being recontracted. Contrary to common belief, bank size alone does not significantly affect exit behavior.

Demirguc-Kunt and Diwan test their results using individual banks' choices in the 1988

Brazil rescheduling deal, the first package specifically based on the menu approach to debt workouts. Their empirical results statistically link commercial banks' characteristics to their portfolio choices — with 83 percent predictability in this sample.

Among the implications for the new debt reduction strategy:

• Larger debt reductions negotiated on a market basis are more costly, per unit of debt reduced. To increase debt reduction, weaker banks must be persuaded to exit, increasing the needed exit price.

• The exit price depends on the strength of the banking industry. So the effectiveness (and cost) of the present debt strategy is affected by changes in the world economy. In boom periods, banks are stronger and exit prices reduced.

• Regulators can affect the cost of debt reduction by altering the regulatory framework within which the banks operate.

• Debt reduction in the developing countries is beneficial to the deposit insurance agencies of the major creditor nations.

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1. Introduction

Reductions of the stock of debt and its service are now at the core of the strategy to bring the debt crisis to an end. Recognizing that reduced cohesion between the banks would not allow the concerted lending strategy to go forward, the new approach seeks financing for debt reduction from the International Financial Institutions while emphasizing the need for voluntary choices among banks between a variety of financial options. Accordingly, recent financing packages (Brazil 1988, Mexico 1989, Philippines 1990, Costa-Rica 1990, Venezuela 1990) have offered a menu of financial instruments- including exit and relending options- from which individual banks could freely choose according to their best interest.[1] Financing packages prepared following this approach are based on a recognition of the diversity of commercial banks' incentives and constraints.

An important issue that arises in this context is the determination of banks' characteristics that can explain their choice when presented with a menu of options. In this paper, we address this issue using both theoretical arguments and an empirical assessment of the Brazil 1988 rescheduling deal--the first package specifically based on the menu approach to debt workouts. Our empirical results link statistically commercial banks' characteristics to their choice of elements of a financing menu.

Absent regulatory and tax considerations and with risk neutrality, the banks' decision rule would be simple. Each bank would choose from the menu the option that is perceived to have the greatest present value. This is the case made by Williamson (1988) and Cline (1989) who clai- that differences in expectations between optimist and pessimist banks represent the major distinction between banks that exit and banks that relend. This view however fails to explain why the optimists do not directly buy out the

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[1]However, the relative pricing of the menu items has remained a concerted exercise.

pessimists.

In this paper, we argue that the exit decision of commercial banks is mainly influenced by the structure of their balance sheet and by the regulatory system within which they operate. It is well known that mispriced deposit insurance (and the safety net in general) subsidizes risk-taking behavior by banks--especially once a bank's financial position deteriorates (for example, see Merton [1977], Sharpe [1978], and Kane [1985]). Bank can increase their value by taking on more risk. They can achieve this by increasing either asset risk or leverage. We focus on the latter. While leverage is limited by capital adequacy requirements, the book value application of those requirements creates extra value for claims whose real value has fallen below book value. In effect, the ownership of such claims allows banks to over-represent their own capital, thus increasing their (real) leverage. As a result, banks that sell inherited debt that is treated at par by regulators lose valuable rights to excess leverage. In our view, real leverage is determined by history, with random shocks imposing losses on certain assets and providing at the same time their holders with rights to "excess leverage", a non tradable asset. Since the FDIC insurance subsidy (and thus excess leverage) is more valuable to weak institutions, a bank's valuation of these "excess leverage" rights is inversely related to the bank's financial strength. This allows us to show that a given menu separates banks into two groups, with the relatively strong banks exiting, and the relatively weak banks relending.

Other studies have focused on the effect of the regulatory framework on the incentives of banks to increase asset risk rather than leverage. The important distinction between those analyses and ours lies in the assumptions about the characteristics of assets other than country debt that can be acquired by banks. For example, Sachs (1989) draws a distinction between the

incentives of small and large banks. He argues that since that large institutions are subject to preferential treatment by regulators which leads them to take additional risks (see Kane [1985, 1989] and Kaufman [1985]), they prefer relending over exit relative to smaller banks. Huizinga and Ozler (1990) distinguish between small and large debtor countries. They argue that insured banks bid up the price of assets that significantly affect their probability of failure. As a result, the secondary market price of a large country' debt is larger than that of an otherwise similar, but smaller country.

These arguments rely on the assumption that the riskiness of debt claims cannot be duplicated by other assets in the market-place. When banks can also increase risk by acquiring substitute assets rather than by increasing their country debt exposure, banks' size cannot explain menu choices. Moreover, for the actions of particular banks to have an effect on the price of particular risk dimensions, monopoly power over certain risk dimensions has to be assumed. Given the small overall size of regulated banks in the global financial markets, this is however not a particularly appealing hypothesis. This view would also imply that each bank should specialize in a certain risk dimension, which we do not observe. Finally, our empirical investigation rejects the hypotheses according to which exposure (and bank size) are negatively correlated to exit.

In contrast, our analysis neutralizes banks' incentives to increase asset risk (by assuming that all the securities that can be held in banks' portfolios are part of the same risk-class) and focuses instead on changes in real leverage.[2] Our main argument is close to those of Sachs and Huizinga

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[2]Another reason for neutralizing the intensity of risk per unit of asset in the analysis is that the issue about whether asset risk and leverage are substitutes or complementary for banks (i.e, whether the marginal value of leverage increases or decreases with asset risk) is unresolved in the banking literature (for both sides of the debate, see Keeley and Furlong [1988] and

(1987) and Bouchet and Hay (1989) who discuss the consequences of book value accounting on exit incentives. They argue that the large money center banks resist exit because debt reduction requires book losses that are costly given their large exposure and weak financial position. We make those statements precise by building a model that characterizes these exit costs.

The rest of the paper is organized as follows: in section 2, we build a model of bank choice behavior that incorporates deposit insurance and capital adequacy considerations, and we derive our main results. We describe the Brazil 1988 agreement in section 3 and test our hypotheses about the determinants of bank choices in section 4. The important implications of our results are discussed in section 5.

2. The Commercial Banks' Decision-Making Framework

Suppose that each creditor bank to a particular debtor country is confronted with two options: each dollar of country debt held can be either rescheduled, or sold at a given price. Our goal in this section is to explore the determinants of this choice. To do so, we develop a simple model of banks' optimal behavior under risk neutrality, focusing on the interaction between mispriced deposit insurance and the book value application of capital adequacy requirements. The model shows that banks with weaker balance sheets and small country exposures tend to prefer relending over exit compared to stronger and to more exposed banks.

2.1 A Simple Model

Consider a simple two periods model of risk neutral banks. Banks differ in the composition of their portfolio of assets. There are N assets (types of loans) indexed by i. The random return at the end of period $t=2$ on a dollar (at book value) of loan i is represented by $\delta^i \lambda \bar{R}$. We take the

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Koehn and Santomero [1988]).

nominal loan obligation $\tilde{R}$ as given in the analysis. In period $t=1$, $\delta^i \epsilon [0,1]$ is known, but λ $\lambda \epsilon [0,1]$ is uncertain. However, all participants know λ's density and distribution functions $f(\lambda)$ and $F(\lambda)$. This parametrization is meant to capture the notion that the actual return on each loan depends on a market factor λ as well as a specific factor δ^i. δ^i can be interpreted as the outcome of the realization of a past shock. We normalize the total book value of the assets of a representative bank to one, i.e $L_0 = \Sigma L^i = 1^3$. We denote by p_1 the "fair" value of market risk, i.e $p_1 = E(\lambda \tilde{R})/R$, and by $p_1^i = \delta^i p_1$ for all i, the fair value of loan i, where $E(.)$ represents the expectation operator and R one plus the risk free interest rate. On the liability side, banks hold deposits, D. We assume that deposits are insured at a fixed cost, and that depositors earn the risk free interest rate, R.[4]

The value of a representative bank can be written as a function of L and D:

$$V_1(.) = (1/R) \int_{\lambda_1}^{1} [\Sigma L^i \delta^i \tilde{R} \lambda - DR] f(\lambda) d\lambda ; \quad \text{with } \Sigma L^i \delta^i = DR \qquad (1)$$

where λ_1 is the state of nature in which the bank fails. When $\lambda < \lambda_1$, the deposit insurance agency repays the part of deposits the bank defaults on.

It would be helpful in the sequel to rewrite the bank's value function in terms of the fair value of its assets $A_1 = [\Sigma L^i p_1^i]$. Let $C_1 = [\Sigma L^i p_1^i] - D = A_1 - D$. The variable C_1 is often called enterprise-contributed equity to differentiate it from federally-contributed equity (see Kane (1989) for a thorough discussion). It is then possible to show that (see appendix 1

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[3]Issues relating to optimal bank size arise with the existence of monopoly profits in some markets; see Atiyas (1990) for an excellent treatment. For our purposes however, we abstract from such issues and analyze only the asset choice per unit of total book value of assets.
[4]With no loss of generality, we take the insurance premium to be zero.

for a derivation):

$$V_1 = C_1 + I_1 ; \quad \text{with} \tag{2}$$

$$I_1 = (1/R) \int_0^{\lambda_1} [DR - \Sigma L^i \delta^i \tilde{R} \lambda] \, f(\lambda) d\lambda \tag{3}$$

$$= (A_1/R) \int_0^{\lambda_1} [(1 - k_1)R - (\lambda \tilde{R}/p_1)] \, f(\lambda) d\lambda \tag{3'}$$

$$(1 - k_1) = D / A_1 \tag{4}$$

$$\lambda_1 = (1 - k_1)p_1 R/\tilde{R} \tag{5}$$

Eq. (2) expresses the value of a bank as a sum of the net fair value of its assets, C_1, plus the value of the deposit insurance subsidy, I_1. I_1 is defined in equation (3) as the difference between the bank's obligation to deposit-holders, DR, and expected available resources $\Sigma L^i \delta^i \lambda \tilde{R}$, integrated over all states in which the bank fails. Further, we have expressed in eq. (3') I_1 in terms of the bank's real leverage $1/k_1$ defined in eq. (4) (note that $(1/k_1) = A_1/C_1$). Eq. (5) redefines the failure state λ_1 in terms of the bank's leverage.

Deposit insurance at fixed cost creates a subsidized source of funds. Given their portfolio of assets (L^i), banks would gain by financing their assets by as much deposits, and as little own capital as possible. It can indeed be checked in eq. (2) and (3) that the bank's value increases with leverage. Without an established minimum deposit to assets ratio, the leverage of risk neutral banks would be unbounded, as would be the subsidy from the taxpayers.

However, capital adequacy requirements (CAR) restrict banks deposits to remain below some multiple $(1-\hat{k})$ of the book value of assets. The CAR can be written as:

$$D \leq L_0 (1 - \hat{k}).$$
(6)

Under risk neutrality, banks would choose to increase real leverage as much as possible. Therefore, the bank's optimal leverage is initially given by:

$$(1 - k_1) - (1 - \hat{k})L_0/A_1.$$
(7)

Real leverage $(1/k_1)$ exceeds $(1/\hat{k})$ whenever the value assets has fallen below book value (i.e, $A_1 < L_0$). The larger the discrepancy between real and book value of assets, the higher is $(1/k_1)$. Because leverage increases the deposit insurance subsidy, I_1, and thus the bank's value, V_1, assets that depreciated after they were booked therefore acquire a special value due to the "excess leverage" rights they confer. The important implication is that no bank would be willing to sell such assets at their fair value.[5] It is also important to realize that those "excess leverage" rights are not transferable, since an asset must be entered in the books at the price at which it is purchased. Thus, a bank with a positive probability of failure values the Brazilian debt it holds on its books at more than its fair value, yet it has no incentives to purchase Brazilian debt from another bank at the fair price. However, this bank would accept to sell its Brazilian debt if the sale price is large enough to compensate not only for the lost future income, but also for the lost "excess leverage" rights. What concerns us here is to analyze the determinants of that exit price.

2.2 Banks Choice from a Menu of Options

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[5] Regulations which require that the bank "mark to market" the remaining debt if it takes a loss on part of a similar debt, which are a feature of the U.S. banking environment, merely magnify the importance of capitalization requirements based on book value accounting.

Consider that each of the creditor banks is now confronted with two options at the end of t-1: each dollar of country debt held can be either rescheduled, requiring (forced) new lending in the amount μ. or it can be sold at a price of $\hat{p} > p_1$.[6,7] When a unit of debt is sold, the proceeds are used to buy risky assets of equivalent value, but the bank must write down its own capital by $(1 - \hat{p})$. To maintain capital adequacy, the bank is then required to raise additional capital $(1 - \hat{p})$, or to reduce deposits by $(1 - \hat{k})(1 - \hat{p})$. In our model, the former policy is preferred (however, our results apply in a stronger form to the case where the bank must shrink).

Assume for simplicity that additional capital must be raised in the form of equity.[8] If e dollars of country debt are sold $(e < L^1)$, the value of the bank for the initial shareholders, $V(.)$, becomes:

$$V_2(e, \hat{p}, \mu) = C_1 + I_2(.) + (\hat{p} - p_1)e - (L^1 - e)\mu(1 - p_1), \qquad (8)$$

where:

$$I_2(.) = [A_2/R] \int_0^{\lambda_2(.)} [(1-k_2(.))R - (\lambda\tilde{R}/p_1)] f(\lambda)d\lambda \qquad (9)$$

$$A_2(.) = A_1 + e(\hat{p} - p_1) - (L^1 - e)\mu(1 - p_1) + e(1 - \hat{p}) \qquad (10)$$

where $\lambda_2(e)$ and $(1 - k_2(.))$ are defined as in eqs. (4) and (5) respectively, but with k_1 replaced by $k_2(.)$, and A_1 by $A_2(.)$. Eq. (8) says that the value-- to old shareholders--of a bank that owns L^1 units of debt and exits on e

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[6]In a pure buyback, μ is set to zero. Also, note that in general, the announcement of a debt reduction will increase debt prices. With no loss of generality, it is possible to interpret p_1 as the ex-post debt price. For an analysis of the equilibrium debt price following a menu driven debt deal, see Diwan and Kletzer (1990).

[7]New lending requires the bank to sell other assets of value μ, or to raise new equity and deposits. In the first case, the bank would choose to dispose of the assets that can be sold at book value. We do not pursue the second case in order to keep size (in terms of book values) constant in our analysis.

[8]Alternatively, additional capital can be raised by issuing subordinated debt. The Modigliani-Miller theorem applies here and the subordinated debt to equity choice is thus undetermined.

units is given by the sum of: the value of its net own capital C_1; the new value of deposit insurance $I_2(.)$; the subsidy it receives on exited debt, $(\hat{p} - p_1)e$; minus the losses incurred from relending a fraction μ of its remaining exposure, $(L^1 - e)\mu(1 - p_1)$. Eq. (10) defines the new value of assets as the sum of: the value of old assets; the exit subsidy; minus the loss from relending; plus the assets purchased with the newly raised equity $e(1-\hat{p})$. Note that this last term is not part of $V_2(.)$, because the value of the new assets is equal to the new shareholders' equity.

Given a menu of options $(\hat{p},\mu)$, each bank must decide how to allocate its country debt L' between the two options so as to maximize its value $V(.)$. Differentiating (8), the marginal effect of exit is given by:

$$\partial V_2/\partial e = \partial I_2/\partial e + (\hat{p} - p_1) + \mu(1 - p_1) \tag{11}$$

Exit at $\hat{p}$ reduces the bank value on account of a reduction in the insurance subsidy I_2 due to the required reduction in leverage (that is, $\partial I_2/\partial e \leq 0$). However, the bank's value increases proportionally to the exit subsidy $(\hat{p} - p_1)$. Moreover, $\mu(1 - p_1)$ of relending costs are saved. As apparent, the marginal benefits are linear in the amount of exit e. The marginal cost of exit, $\partial I_2/\partial e$, however depends on the amount of exit. It is possible to show that $\partial^2 I_2/\partial e^2 > 0$ (see appendix). The intuition is simple: as a bank sells a unit of debt, the probability of failure is reduced, making further exit less costly. As a result, the optimal response to a menu $(\hat{p},\mu)$ is a corner solution: either a bank exits completely, or it only relends.

2.3 Characteristics of Exiting Banks

We are now in a position to analyze the characteristics of banks that choose to exit rather than to relend. Denote by V^R and V^E the values of the

bank when it only relenr (e = 0) and exits (e = L^1) respectively. We can compute $\underline{p}(\mu, k_1, L^1)$, the smallest price at which a bank with "financial strength" k_1 and exposure L^1 is willing to exit. Formally, $\underline{p}(.)$ solves:

$$V^R = V(0, \underline{p}, \mu) = V(L^1, \underline{p}, \mu) \equiv V^R \qquad (12)$$

which reduces after some manipulations to:

$$(I^R - I^E) = L^1 [\mu(1 - p_1) + (\underline{p} - p_1)] \qquad (13)$$

where I^R and I^E are the values of deposit insurance at e = 0 and e = L^1 respectively. Equation (13) states that $\underline{p}$ is the exit price at which the total loss from exit (ΔI) is equal to the total benefit of exit.

(i) Effect of financial strength: From (13), it is easy to verify that banks with a stronger financial position given exposure, i.e larger losses on their balance sheet for a given exposure would exit at a lower price than weaker banks. We show in appendix 3 that:

$$d\underline{p}/dA_1 |_{L^1} \leq 0. \qquad (14)$$

This result is due to the fact that in the model the marginal value of real leverage increases with the probability of failure. The stronger a bank, the less it values excess leverage.

(ii) Effect of Exposure From (13), it is also possible to show that banks with a larger exposure to the country would accept to exit at a lower price than banks with a low exposure, given financial strength, that is (see appendix 3):

$$\partial \underline{p}/\partial L^1 \mid A_1 \quad \le 0. \qquad\qquad (15)$$

The intuition now is the following. Take two banks with equal strength, but with bank A more exposed to Brazil than bank B. Both require an equal price to sell their fist unit of Brazilian debt, and lower prices for subsequent units (because they are now stronger). But because A is more exposed, it continues to sell Brazil debt at lower prices when B is already completely out. As a result, A would be willing to exit completely at a lower average price than B.

3. The Brazil 1988 Refinancing Package

The deal reached between Brazil and its Bank advisory committee in June 1988 formally terminated the moratorium declared by Brazil in February 1987. The package had three main components:[9]

o The restructuring of $62 billion of outstanding debt into a single deposit (MYDFA) facility in Brazil's central bank and the renewal of trade and interbank credit lines;

o four new money packages totalling $5.2 billion;[10]

o and an exit option that can be substituted for new money.

The deal presented the banks with a two-step decision. (a) First, each bank had to determine the extent to which it desired to exit. By converting (all or part of) its exposure to the exit bond, the bank would escape the new money requirement on that part of its exposure. (b) Second, each bank had to reschedule its remaining exposure and provide new money loans in proportion to its remaining exposure. The total new money contribution of each bank had to be allocated to one of the four available new money facilities.

The size of the required new money contribution was computed by

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[9] For details, see Lamdany 1989.
[10] A summary of each option characteristics appears in table 2.

taking 11.4 percent of each individual bank's remaining Brazil exposure, which was determined by its 1987 exposure minus the size of its holding of the new exit bond. In case a bank decided instead to exit on a certain portion of its outstanding loans, it had to convert its old loans into a new exit bond.

More than 90% of the new money was committed by August 5, the deadline to receive an early participation fee. In September, the agreement was signed by Brazil's creditors, and in November, the first tranche of $4 billion of the new-money loans were disbursed.

Predictions of the Model

The exit bond offers a below market interest (of 6 percent) and the conversion took place at par. It was also agreed that the exit bond could be exchanged on competitive terms for a new financial instrument to be issued in the future--the OTN--that would be indexed on the value of the dollar.[11]The institutions that chose to exit and retain the exit bond in their portfolio did not have to write-off their capital directly, but the lower interest earned will result in future losses in their income statements, lowering their book capital through the retained earnings account. Banks that expected to swap their exit bonds for OTNs would however have to write-off the difference between the values of the two instruments.

Our model predicts that the relatively stronger and more exposed banks would be more interested by the exit bond than the relatively weaker and less exposed institutions.

Our model also predicts that each bank would choose only one option (corner solution). However, this last prediction cannot be tested directly using the Brazil 1988 deal. The supply of the exit bond was restricted to a

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[11]This last part of the agreement has not been implemented however.

maximum of $5 billion but only $1.2 billion was issued. This was not however
a reflexion of a lack of demand for exit bonds, but was rather an unfortunate
consequence of the distribution mechanism in place. The allocation of the
options was achieved in two rounds. In the first round, banks indicated two
dollar figures for each option: a bid (restricted by some ceilings), and a
reallocation. Banks received the options they bid for, and the uncommitted
portion of each facility was then reoffered to banks that acquired this
option during the first round and elected to reallocate all or part of their
commitment to that option. Each bank's share of the remaining amounts of each
option was then determined in a second round by pro-rating their reallocation
bids. However, the reallocation bid most banks choose turned out to be the
new money trade facility (which indeed ended up oversubscribed), because it
was rightly expected that this option was more valuable than any other. As a
result, we expect that the weaker and more exposed banks chose to only relend
while the stronger and more exposed banks exited at least partially.

4. The Empirical Model

In this section, we attempt to assess empirically the characteristics
of exiting banks using data from the Brazil financing package. Table 3
describes banks' choices based on their asset size and nationality (since
breakdown based on exposure is similar to that based on asset size, it is not
reported). Bank choices based on nationality do not seem to differ
significantly. Approximately 40 to 50 percent of the banks in each group
exited or partially exited, while the rest chose to only relend. Differences
are not blurred, however, when banks are grouped based on their asset sizes.
Clearly, smaller banks preferred to exit whereas largest banks chose to only
relend. Nevertheless, the choice behavior indicated by table 3 may be
misleading. Banks may be affected by other factors while making their
decisions. Our model predicts that strong banks will exit, and we are also

interested in evaluating the importance of such factors as exposure, nationality, and long-term business interest. Numbers in table 3 may not give us an accurate picture since we do not control for these additional factors. Our aim is to study all relevant effects simultaneously to be able control and separate individual effects.

To test the implications of the theoretical model, we need an empirical model of bank choice behavior. Because banks' decision cannot be predicted with certainty, we model the choice probabilities. The empirical model describes the choices among a limited number of alternatives by relating the conditional probability of a particular choice being made to bank characteristics identified by our theoretical model.

Consider modelling the choice behavior of banks when two alternatives are available (exit partially vs. relend only) and one must be chosen[12]. The decision by the ith bank can be conveniently represented by a random variable D_i that takes the value one if the bank chooses to only relend and the value zero if the bank partially exits. Let P_i represents the probability that D_i takes the value one. It is of interest to estimate the probabilities P_i as well as how various explanatory variables affect P_i.

As in the case of the theoretical formulation, the individual bank makes the decision that maximizes the expected value of its equity. Assume the expected equity value of the institution (V_i) differs under each choice due to banks' individual characteristics and a random disturbance. Then, assuming linearity,

$$V_{i0} = a_{i0}C_i + e_{i0}, \quad \text{and} \tag{16}$$
$$V_{i1} = a_{i1}C_i + e_{i1},$$

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[12]Note that this analysis can be easily extended to j>2 alternatives in a financing package. See Judge et al., 1985, ch. 18.

where C_i is the vector of characteristics of the ith bank, and e_{i0} and e_{i1} are random disturbances. Thus $D_i = 1$ if $V_{i1} > V_{i0}$ and $D_i = 0$ otherwise. Then,

$$P(D_i = 1) = P \ (V_{i1} > V_{i0}) \tag{17}$$
$$= P \ [(e_{i0} - e_{i1}) < [a_{i1}C_i - a_{i0}C_i] = F(x_i\beta),$$

where $x_i\beta = (a_{i1} - a_{i0})C_i$ and F is the cumulative distribution function of $(e_{i0} - e_{i1})$. Therefore, P_{ij}, the probability that the ith bank will make the jth choice will be a function of C_i.

Following equation (17), the empirical model is:

$$P(D_i=1) = f(MV/A, \ BV/A, \ PCLLR, \ LLR/BV, \ EX/BV, \ DUS, \ DEUROPE) + e \tag{18}$$

The model estimated relates the conditional probability of making a choice to bank characteristic proxies explained below and listed in table 4.

4.1 Choice of Proxy Variables

The theoretical model explained in section 2 identifies the financial strength--more precisely, real leverage $k_1 = (C_1/A_1)$--of the institution as a crucial determinant of its choice. However it is not easy to capture this variable. We use two direct proxies for real leverage, the book value (BV) and the market value (MV) of the institutions' capital, deflated by the total book value of their assets (A). Neither variable is an accurate estimate of real leverage: entreprise-contributed equity of bank are not known; BV of equity is likely to have a positive bias since managers of weak financial institutions have incentives to overstate their capital; MV of equity, as given by the value of outstanding stock of the institution, has a negative bias because it captures the value of deposit insurance guarantees in

addition to the fair value of the institutions' own capital.[13]

We use two indirect measures of financial strength to correct for biases introduced by the use of market and book values of assets. The loan loss reserves (LLR) to BV ratio is used as a measure of how deceptive the book value of assets for institutions that are allowed to include loan loss reserves in their capital, since including anticipated losses in institutions' book value overestimates their equity. The percentage change in LLR is used to measure how deceptive market values are. Market values can be relatively high for weak institutions because they partly capture federal-contributed equity. As discussed in the next section, the percentage change in LLR can be taken as a direct signal of a bank's portfolio quality in the U.S and in Japan. However (se below), due to national differences surrounding the costs and benefits of provisioning decisions, we do not expect those variables to affect banks' menu choices in the other OECD countries.

Exposure is another factor identified by our model as a determinant of bank choices. Holding financial strength constant, our model predicts that more exposed banks exit more. On the other hand, other models, as well as intuitive statements often predict the opposite, i.e, that more exposed banks are more likely to relend. Thus, the institutions' exposure to Brazil (EX), and to other developing countries (TEX) are included to test the direction and significance of this effect.

The decision of two banks with identical strengths and exposures may also differ due to differences in the regulatory, fiscal and accounting system in the countries in which they operate (see 4.2). To study national differences in general, dummy variables are used (DUS, DEUROPE and others).

Finally, we want to test the widely held hypotheses that large

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[13]The variable C_1 used in our model (often called enterprise-contributed equity)is the market value of an institution's equity net of its federal insurance guarantees. See Kane (1989) for a thorough discussion.

institutions, and institutions with long-term business interests in the country prefer to relend rather than exit. The empirical model also includes proxies to capture these effects. As size proxies, total assets (A) and total liabilities (L) are used. To proxy long term business interests of institutions, dummy variables indicating banks' number of branches in the country are included.

4.2 A Parenthesis on Provisioning Policy

In the model developed above, we considered that it is when an asset is sold for less than its book value that regulatory costs are imposed. Moreover, we ignored the existence of tax benefits associated with losses. Thus, we did not analyze banks' incentives to recognize losses without actually disposing of assets. But in reality, banks can recognize losses through provisioning rather than solely through market sales. In some countries (the U.K, Switzerland, Canada, France and Germany), tax benefits accrue when losses are recognized through provisioning. But in the US and Japan, tax benefits only accrue as a result of exchanges and buybacks, and there are no tax benefits to provisioning. On the cost side, provisioning is devoid of regulatory costs in some of the creditors countries: the US, France and Japan allow commercial banks to include loan-loss provisions (LLR) in capital. However, most other OECD countries do not consider LLR to be part of the bank's capital, making provisioning costly in regulatory terms. The Basle agreement--which will take full force in 1992--calls however for the exclusion of LLR from capital in all OECD countries.

Let us now compare exit against provisioning.

(1) In France, provisioning offers tax advantages but no regulatory costs. Thus, all banks should provision as much as allowed with timing depending on tax shelter considerations only. Once provisions are in place, exit offers no

tax advantage, but it is costly in regulatory terms.

(2) In Canada, Switzerland, Germany and the U.K, provisioning and exiting offer the same tax advantages and regulatory costs. As a result, provisioning allows banks to exit partially and at their preferred speed. Once provisions are built, exit may allow for additional tax benefit and regulatory cost, depending on the size of the provisions.[14]

(3) In the US and Japan, provisioning was devoid of any important regulatory costs and tax benefits at the time the deal was finalized.[15] However, the Basle agreements reached in 1987 specify that starting in 1992, provisions will be excluded from capital. As a result, existing provisions will become costly in 1992. By then, banks that have built LLR will have to raise capital or reduce assets. Thus, starting in 1987, reserving must have been perceived as costly, especially as no tax benefits were available. However, increases in provisions became a popular bank strategy since May 1987, when Citicorp increased its provisions by $ 3 billion. The market reacted with an 8 percent rise in its stock price. More generally, event studies show that banks that increased their LLR experienced a rise in stock prices, while those that did not lost value [Grammatikos and Sanders (1988), Musumeci and Sinkey (1990)]. It is then tempting to interpret provisioning policy as a tool banks have been using to signal the true quality of their assets (that is, C_1) to the market-place. Since raising capital will be less costly to banks that will be perceived as strong in 1992, building provisions must be perceived as less costly by the insiders of those banks. The signalling hypothesis is that stronger banks (from the U.S and Japan, but not from other OECD countries

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[14]However, in case of over-provisioning, the bank may have to pay taxes on the gains that arise from the sale, and this discourages exit. This seems to be the case for several German banks.

[15]For Japanese banks capital inclusion of reserves is allowed up to 14 percent and tax deductibility for only one percent. U.S. and Japanese banks have 50 percent and 15 percent reserve levels respectively.

where provisioning policy is driven by tax considerations) have used

provisioning policy as a means to signal the true value of their current

portfolio and reduce their current cost of funds.[16]

Another aspect of commercial bank regulations that affects the choice

between new money and exit instruments is the mandated provisioning rules for

bad loans. When such provisions are required, relending becomes taxed

relative to exiting and therefore becomes less attractive. This is especially

true in Canada, Switzerland and in the U.K.

4.3 Estimation Technique and the Data Set

Estimation of this model is possible using a qualitative response

model. The type of the model obtained depends on the choice of F in equation

(13). Most common choices in economic applications are linear, normal, and

logistic functions which lead respectively to linear, probit, and logit

probability models. Here, Logit Maximum Likelihood Method is used[17].

To analyze banks' choice behavior, the participants in the Brazil

financing package are categorized into two classes based on their choices:

1. no exit, 2. exit (partial or complete). Dependent variable is assigned the

value zero for exit and value one for no exit choices.

Before the estimations, candidate proxy variables are checked for

possible multicollinearity, using Belsley, Kuh, and Welsch (1980) two step

procedure. This procedure combines two diagnostic tools to detect which

coefficients are most likely to be affected by the collinearity. The first

statistic is the condition number of the X matrix (regressor matrix) which is

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[16]However, the argument above does not imply that banks that increased their LLR to signal strength have ended up with a larger ratio of LLR relative to assets. In fact, in our sample, those banks' LLR to assets ratios have remained relatively constant, indicating that banks that have increased provisions have also tended to raise new equity.
[17]The alternative models and their underlying assumptions are discussed in detail in Judge et al. (1985) and Amemiya (1981).

defined as the ratio of the square roots of the minimum and maximum eigenvalues of X'X matrix. The condition number is unity when the columns of X are orthogonal and rises above unity with collinearity between columns. The second diagnostic tool is the regression coefficient variance decomposition, which is used to compute the proportions of coefficient variances associated with each eigenvalue. In the first step the eigenvalues that signal multicollinearity are identified. The second step inspects the proportions of the sampling variance of each coefficient associated with those eigenvalues and detects the regressors that are causing the X'X matrix to be ill-conditioned.[18]

The multicollinearity test indicates that only two variables are dangerously correlated: Market and book values of equity. Therefore, they are used alternatively in regressions. Different specifications are compared based on three criteria recommended by Amemiya (1981). These are model chi-square, Akaike's information criterion (AIC), and in-sample classification accuracy. (i) Model chi-square is the outcome of a likelihood-ratio test of the joint significance of all variables in the model. It is measured as twice the difference in log likelihood of the current model from the likelihood only based on the intercept. The null hypothesis that all the explanatory variables in the model are zero is rejected if the calculated chi-square statistic is grater than a critical value. (ii) Akaike's (1973) information criterion (AIC) is desirable in comparing models with different degrees of freedom since it makes an adjustment to penalize for the number of parameters estimated. It is given by the negative log likelihood of the model plus the number of estimated parameters. We seek the model for which AIC is the smallest. (iii) In-sample prediction accuracy indicates the overall classification accuracy of the model. It is given by the total percentage of

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[18]See Belsley, Kuh, and Welsch (1980) for further details of the technique.

correctly classified observations and is a determinant of statistical fit (Maddala, 1986).

Final model specifications, determined based on the above criteria, are further tested using Davidson and MacKinnon (1984) specification test for logit and probit models. This is a general specification test that is capable of detecting various forms of model inadequacy such as omitted variables, structural shifts in coefficients, and heteroskedasticity. The Lagrange multiplier test statistic is given by the explained sum of squares from an artificial linear regression in which a vector of ones is regressed on a constructed vector of variables[19].

Data

The banks that participated in the 1988 Brazilian financing package are classified into three groups: U.S., Japanese, and European (including Australia and Canada) banks. All banks refer to the consolidated banks, i.e., bank holding companies. Bank data are obtained from Moody's Bank Manual, Nihon Keizai Shimbun Bank Annual Tapes, and IBCA for U.S., Japanese, and European banks respectively. Stock price information is obtained from Wall Street Journal for U.S. banks, from Nihon Keizai Shimbun for Japanese banks, and from Financial Times for European banks. When explanatory variables are not in terms of percentages, they are converted to US$ using exchange rate information obtained from Financial Times. Definitions are given in table 4.

For each institution, where possible, two-year (1986, 1987) year-end annual time series data are collected. Each bank's Brazilian exposure and participation in the financing package are given in Gazeta Mercantil, March 26, 1989. In the resulting data set approximately 70 percent of the deal is represented. The Japanese and US bank data sets are more complete and

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[19]The equations used to construct the artificial variables and description of the test in detail are given in Davidson and Mackinnon (1984).

representative than that of the European banks.

4.4 Estimation Results

The results are reported in table 5. The two samples used are the U.S. and Japanese banks and all banks. The U.S. and Japanese banks are first analyzed separately since their data set is more complete and homogeneous. The first column in table 5 reports results for U.S. and Japanese banks. These two groups of banks do not significantly differ in their choice behavior. This is evidenced by the insignificant coefficient of the nationality dummy variable, DUS. Although not reported, dummy variables for slope coefficients do not prove significant either.

All the proxies for financial strength develop significant coefficients with the expected sign, indicating that the weaker institutions are less likely to exit. In particular, we find that banks with higher MV to assets ratios and with higher increases in LLR tend to exit more, and that banks with higher LLR to asset ratios tend to exit less.[20] These results strongly confirms the main prediction of the theoretical model.

The exposure to Brazil debt to book value ratio produces a negative and significant coefficient, thus confirming another result of our model. Controlling for financial strength, the greater the exposure of the institution, the less likely it is to only relend.[21]

The affiliate and branch dummy variables and asset size variable all produce positive yet insignificant coefficients. The positive sign for affiliate and branch dummy variables are expected since they are included to capture, at least partially, the value of banking assets of the institutions

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[20]Both MV and BV coefficients capture this effect, however the specification including BV is not reported since it is significantly inferior based on our criteria.
[21]Due to incomplete information, the variable TEX turns out to be insignificant.

in Brazil. When this value is larger, banks are expected to relend rather than exit. The positive signs are consistent with this argument, yet their insignificance indicates that the dummy variables do not capture all the information, and we lack better proxies.

Asset size coefficient's positive sign indicates that larger institutions are more likely to relend. However since it is insignificant, we can conclude that controlling for other characteristics, size is not an important determinant. As indicated by table 3, large institutions appear to relend rather than exit. Yet this effect is not statistically significant in the Brazil deal, once we control for other characteristics. The widely held belief that it is the large--rather than the weak--institutions that relend may be simply due to the fact that in the U.S, large banks tend to be weak. However, the inclusion of other types of banks in the sample--and in particular of many small and weak banks--indicate that size per se has not been an important determinant of exit behavior.

The last two columns of table 5 report results for all banks. The most important difference is indicated by the European bank dummy variable, DEUROPE. Its negative and significant sign underlines the differences in choice behavior of European banks. As argued above (section 5.2), European banks (excluding the French) are expected to be willing to exit at lower prices since they tend to have higher provisions already in place.

Decomposing the dummy variable to investigate whether any of the regressors affect European banks differently leads to interesting results. As reported in the last column, dummy variables for percentage increase in loan loss reserves and loan loss reserve to book value ratio (DPCLLR, DLLR/BV) prove significant but have the opposite signs of the benchmark coefficients. Thus, as expected, PCLLR and LLR/BV variables affect the decisionmaking of US and Japanese banks, but not of European banks. The rest of the regressors

still have the same effects.

The overall statistical fit of the model is given by the criteria reported at the foot of table 5. The joint insignificance of independant variables is rejected at the one percent significance level for alternative spec'fications and the model classifies up to 83 percent of bank choices correctly. The null hypothesis of no misspecification cannot be rejected at the five percent significance level for any of the reported specifications.

5. Conclusions

This study provides evidence that bank characteristics are significant determinants of commercial-bank choice behavior when confronted with a menu of options. We develop a theoretical model of bank choice behavior and empirically test its implications using data from the 1988 Brazilian financing package. Our empirical results show that bank characteristics are capable of explaining over 80 percent of this choice.

One of the main implications of the theoretical model is that under risk-neutrality assumption, financially stronger and more exposed banks prefer to exit. These results are also supported empirically. Furthermore, contrary to common belief, we find that bank size per se does not significantly affect exit behavior.

Our finding have several important implications for the new debt reduction strategy. (i) First, larger debt reductions operated on a market basis are more costly, per unit of debt reduced. In order to increase debt reduction, weaker banks must be convinced to exit, increasing the needed exit price. (ii) Second, the exit price depends on the strength of the banking industry, and thus, the effectiveness (and cost) of the present debt strategy is affected by changes in the world economy. In perods of booms, banks become stronger and exit prices are reduced. (iii) Third, regulators can affect the cost of debt reduction by altering the regulatory framework within which the

banks operate. (iv) Forth, LDC debt reductions is beneficial to the deposit insurance agencies of the major creditor nations.

Our results have important implications for the analysis of the secondary market for LDC debt. One implication of our model is that due to differences in valuations between (insured) buyers and sellers of debt, the volume of debt in "circulation" must be small. Indeed, traded volumes in LDC debt have been extremely low--especially after correcting for demand by the debtor country-but increasing overtime. At the same time, LDC debt prices have declined overtime and especially after 1986, with the magnitude of decline unexplainable by increasing debt or worsening fundamentals alone. The model developed above can explain those stylized facts. Due principally to subsidized debt to equity swap programs, buyers have been willing to pay more than the fair price to acquire country debt.[22] Given their reservation price all banks above a certain strength sold their exposure, while weaker banks held onto their claims.[23] Thus, the observed market price must be interpreted as the value of debt to the marginal bank. Furthermore, the supply of debt-- and thus trade volumes--must have gone up, and debt price down, as the banking industry regained strength after the big slump of 1982. Finally, it should be recognized that the debt of similar countries can trade at very different prices if one of the countries engaged in subsidized debt reduction programs while the other did not.

Finally, our results shed new light on the present debt strategy. Under the old strategy, the IFIs required the commercial banks to share in the cost of attempting to reform the debtor countries economies by sharing in the supply of new loans. However, as banks' financial situations started to

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[22]Indeed, there is evidence showing that the existence of debt/equity swap programs increase debt prices (Salomon:20 percent, Acharya Diwan:16 percent)
[23]James (1990) finds direct empirical evidence that LDC loans held by the core lenders exceeds their secondary market prices.

diverge in the mid-eighties, the concerted new money approach broke down. Strong banks now resisted large new money calls. By 1988, after the completion of the Brazil deal, new commercial credits litteraly dried up. The Brady initiative should then be seen as an attempt to reduce the tensions within the creditor group by tailoring financial instruments to the specific needs of banks, in particular, to allow strong banks to exit and weaker institutions to relend. By negotiating on a menu ex ante and allowing banks to choose ex post the options that they value most, a better burden sharing between the IFIs and the commercial banks can be achieved without unsurmountable coordination problems.

Important tasks for future reseach are to extend the analysis of menu choices to an equilibrium framework, to study the role of more complex options such as exit and par bonds, and to empirically examine banks' choices in more recent debt deals such as the Mexican deal of 1990.

Appendix of Proofs

1. The value of the insured bank is given by:

$$V^I = \int_{\lambda^I}^{1} [(L\tilde{R}\lambda)/R - D] f(\lambda)d\lambda ; \quad \text{with } L\tilde{R}\lambda^I = DR \tag{A1}$$

The uninsured bank must borrow from depositors at a rate R^U given by:

$$DR = [DR^U [1-F(\lambda^U)] + \int_{0}^{\lambda^U} [L\tilde{R}\lambda]f(\lambda)d\lambda, \quad \text{with } L\tilde{R}\lambda^U = DR^U. \tag{A2}$$

Its value is given by:

$$V^U = \int_{\lambda^U}^{1} [(L\tilde{R}\lambda)/R - (DR^U/R)] f(\lambda)d\lambda = \int_{\lambda^U}^{1} [(L\tilde{R}\lambda)/R] f(\lambda)d\lambda - (DR^U/R)[1-F(\lambda^U)]$$

$$= \int_{\lambda^U}^{1} [(L\tilde{R}\lambda)/R]f(\lambda)d\lambda + \int_{0}^{\lambda^U} [(L\tilde{R}\lambda)/R]f(\lambda)d\lambda - D \quad \text{using (A2)} \tag{A3}$$

$$= L E(\lambda\tilde{R}/R) - D = Lp_0 - D \tag{A3'}$$

where we define $p_0 = E(\lambda\tilde{R}/R)$, with E the expectation operator, p_0 the "fair" price of the loan L, and Lp_0, the initial "fair" value of loans L. Subtracting V^U from V^I using (A1) and (A3'), we get the value of the insurance subsidy I:

$$I \equiv V^I - V^U = \int_{\lambda^I}^{1} [(L\tilde{R}\lambda/R) - D]f(\lambda)d\lambda - \int_{0}^{1} [(L\tilde{R}\lambda/R) - D]f(\lambda)d\lambda$$

$$= \int_{0}^{\lambda^I} [D - (L\tilde{R}\lambda/R)]f(\lambda)d\lambda$$

2. Differentiating equation (9) with respect to e, we have:

$$\partial I(.)/\partial e = (\partial A_2/\partial e)(I/A_2) + A_2(\partial(1-k_2/\partial e)F_2, \quad \text{where } F_2 = F(\lambda_2), \tag{A4}$$

Furthermore, using eqs. (10), (4), (5) and (6), we can compute:

$$\partial A_2/\partial e = (1 - p_1)(1 + \mu) > 0 \tag{A5}$$

$$\partial(1-k_2)/\partial e = -(1 - k_2)(\partial A_2/\partial e)/A_2 < 0 \tag{A6}$$

$$\partial\lambda_2/\partial e = (R/\tilde{R})(\partial(1-k_2)/\partial e) < 0 \tag{A7}$$

$$\partial\lambda_2/\partial(1-k_2) = R/\tilde{R} > 0 \tag{A8}$$

Feeding (A5) to (A8) into (A4) and reducing, we get:

$$\partial I(.)/\partial e = - (\partial A_2/\partial e) \int_0^{\lambda_2} [\tilde{R}\lambda/R]f(\lambda)d\lambda \leq 0 \tag{A9}$$

differentiating (A9), and using (A7) and (A8), we get:

$$\partial^2 I(.)/\partial e^2 = - (\partial A_2/\partial e)(\partial\lambda_2/\partial e)\lambda_2\tilde{R} > 0$$

$$\partial^2 I(.)/\partial e\partial(1-k_2) = - (\partial A_2/\partial e)(\partial\lambda_2/\partial(1-k_2)\lambda_2\tilde{R} < 0 \tag{A10}$$

3. Rewrite eq. (13) as:

$$G(\underline{p}, A_1, L^1) = (I^N - I^E) - L^1 [\mu(1 - p_1) + (\underline{p} - p_1)] = 0$$

Using the implicit function theorem, we get:

$$\partial\underline{p}/\partial A_1 | \ L^1 \quad = - [\partial G(.)/\partial A_1]/[\partial G(.)/\partial\underline{p})]$$

$$\partial\underline{p}/\partial L^1 | \ A_1 \quad = - [\partial G(.)/\partial L^1]/[\partial G(.)/\partial\underline{p})]$$

Computing the needed partial derivatives:

$$\partial G(.)/\partial\underline{p} = - L^1 \leq 0,$$

$$\partial G(.)/\partial A_1 = [\partial I^N/\partial A_1 - \partial I^E/\partial A_1] \ < 0 \quad \text{using (A10)}$$

$$\partial G(.)/\partial L^1 = \ - [\mu(1 - p_1) + (\underline{p} - p_1)] < 0,$$

we get the results of eqs. (14) and (15) in the text.

Table 2
Characteristics of the various menu items

Item	Total amount	Rate	Tenure (years)	Grace (years)	Debt to Equity	Relending	Bearer
Rescheduling							
MYDFA	62,000	13/16	20	7	auction	X	
Interbank	4,600	5.8	up to 1	na	to trade	na	
Trade	10,200	5.8	up to 1	na	to interbank	na	
New money	5,200						
New money bonds[1]	674	13/16	12	5	auction		X
Cofinancing	750	13/16	12	5	auction		
New trade[2]	600	13/16	9	9			
Parallel	3,176	13/16	12	5	at par	X	
Exit	1,200						
Exit bonds	1,200	6 fixed	25	10	auction[3]		X

Notes: 1. also exempt from Brazilian taxes
2. bullet maturity
3. can also be converted into a dollar indexed bond that would be traded in the Brazilian capital market.

Table 3
Bank Choices Based on Nationality and Size

I. Nationality	only exit	exit and relend	only relend
US	7%	40%	53%
JAP	17%	21%	61%
EUROPE	16%	19%	65%

II. Asset Size	only exit	exit and relend	only relend
top 10	0/10	3/10	7/10
top 20	1/20	10/20	9/20
smallest 20	13/20	0/20	7/20
smallest 10	7/10	0/10	3/10

Source: Complete data on the 1988 Brazilian Financing package from the newspaper Gazeta Mercantil.

Table 4
Variable Definitions and Sources

MV: market value of the institution's equity. MV is the price per share
multiplied by the number of shares outstanding.
BV: book value of the institution's equity. BV is the book value of assets
minus the book value of liabilities and is given by the sum of capital
stock, surplus, undivided profits and reserves.
A: total asset size of the institution.
L: total liability size of the institution.
LLR: loan loss reserves of the institution.
PCLLR:percentage change in loan loss reserves.
EX: 1987 Brazilian exposure of the institutions. It is calculated from:
$EX = (o1+o2+o3+o4)/.114 + oe$
where o1-o4 are the new money options and oe is the exit option as given
in Gazeta Mercantil (Economia), March 26,1989.
TEX: institution's total exposure to all LDCs.
DA, DB: dummy variables for the institution's affiliates or branches in
Brazil. They take the value zero or the number of existing branches or
affiliates.
Other Dummy Variables: country or region dummy variables (e.g., DUS, DJAP,
DEUROPE, denoting U.S., Japanese, and European banks), and above
variables multiplied by country dummies are also included.

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Notes: US bank data are obtained from Moody's Bank Manual. Japanese bank data
are from Nihon Keizai Shimbun Bank Annual Tapes. Data for the rest of the
banks came from IBCA.

Table 5: Logit Analysis of Bank Choice Behavior
Dependent variable: bank choice

independent variables	US & JAPAN (1)	ALL	(2)	(3)
cons	-4.52** (1.96)		-2.56* (1.21)	-3.08* (1.34)
DUS	1.86 (1.57)			
DEUROPE			-2.62** (0.95)	
MV/A	-2.5* (1.08)		-1.63** (0.62)	-1.73** (0.67)
PCLLR	-7.55** (2.64)		-3.79* (1.17)	-4.60** (1.39)
LLR/BV	7.47** (3.00)		4.07* (1.81)	6.50** (2.45)
EX/BV	-7.02* (3.82)		-4.50# (2.58)	-6.65* (3.19)
DLLR/BV				-13.27** (5.01)
DPCLLR				7.91* (3.54)

Summary Statistics

Number of obs.	50		72	72
Model Chi-square	26.38**		22.25**	30.69**
AIC	27.3		42.8	41.1
Total correct	78%		71%	83%

Notes: Standard errors are given in parantheses.
Dependent variable is assigned value 1 for banks that only relend (no exit), and value 0 otherwise (partial or complete exit). Independent variable definitions and sources are given in table 4.
**, *, # indicate coefficient estimates that differ significantly from zero at 1, 5, and 10 percents respectively.

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