VALUATION MODEL FOR LESS DEVELOPED COUNTRIES' DEBT IN THE SECONDARY MARKET

by

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Submitted to the
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Abstract

The purpose of this thesis is to contribute to the understanding of the secondary market for Less Developed Countries' debt. First, I described the market and identified the variables that can be influencing the price formation process. The analysis is particularly complex because in addition to those variables related to the credit quality of the debtor, we have to account for those related to the functioning of the market and the institutional arrangements.

Most empirical studies on the Less Developed Countries' loan market have emphasized the use of cross-sectional analysis, mainly because of the lack of timely data. They included a large number of countries in order to improve the efficiency of the econometric estimators.

In this thesis, I only included countries whose debt had been actively traded, arguing that prices at which no transactions occur are meaningless. I analyzed the market using the technique of pooling time series and cross-sectional data. This methodology has several advantages: provides a larger number of observations improving the efficiency of econometric estimators, allows for the testing of more complicated models, and reduces the effects of unobserved variables.

The results corroborate that the price of a country's debt is positively related to the growth of an economy and inversely related to the relative amount of debt. A very strong negative relationship is found with the level of bank's reserves, the Libo rate, the rate of inflation, and the degree to which a country services its debt.

Thesis Supervisor : Rudiger Dornbusch
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Introduction

This thesis examines the market in which Less Developed Countries' Debt is traded. The primary purpose is to contribute to a better understanding of the price formation process. Among the variables that can be affecting the price of the loans we have those related to the countries' credit quality (ability and willingness to pay), those related to the functioning of the market (demand, supply, trading practices), and those related to the institutional arrangements and negotiation process (IMF programs, reschedulings, new money).

The objective is not to obtain an absolute measure of value. This can be very hard to achieve in such a fragmented market, particularly because of the large number of variables that cannot be quantified.

There are other studies on the same topic that consider a larger sample of countries during shorter periods of time. Here, I concentrated only on those countries whose debt is actively traded. The price information available for the debt of non-actively traded countries is meaningless because at these prices no transactions occurred. I am also considering a larger period of time, and by using quarterly data, I am capturing short term fluctuations.

In Chapter One, I do a comprehensive analysis of the secondary market, study its evolution and the main forces explaining behavior of demand and supply, and identify different variables that may influence the price formation process. In Chapter Two, I list these variables and test them using standard regression techniques. An interpretation of the findings follows.

Chapter 1 - The Secondary Market

1.1 Overview

The present debt crisis is not an unprecedented event. Latin America already suffered four major debt crises: 1825, 1875, 1890, and 1930. Many similarities can be found between these crises and the current one. In all situations we have a loan boom period determined by the growth of the world economy. Later on, instabilities arise in the lenders' money markets and interest rates rise sharply boosting debt service payments. The increase in interest rates slows down the world economy, contracting world trade, and depressing commodity prices. This in turn reduces the balance of visible trade of developing countries.[1] The combined effect of interest rates and commodity prices reduces the current account balance, increasing the country's foreign debt.[2] But there are also important differences between the past and the present debt crisis. The major difference lies in the size of the debt.[3] The last word on whether a country's debt is growing sustainable or unsustainable rests with financial markets. As long as lenders are willing to lend more, the increasing debt is sustainable, if they are not, it is not. This principle did not seem to have applied because:

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[1] Commodities historically represented a high proportion of developing countries' export income.

[2] The annual change in a country's foreign debt is equal to its current account balance. If the country has a current account deficit, its debt will rise.

[3] When comparing the size of the debt across countries and along time, in order to obtain a more reasonable basis for comparison, one should standardize the size of the debt using population (debt per capita), GNP (debt over GNP) or exports (debt over exports).

1.- The loan boom has been reinforced by the excess supply of funds that were available for lending. The oil shocks of 1973 and 1975 caused an accumulation of funds by oil exporting countries that was recycled through the major financial markets.

2.- In the past, the public flotation of bonds was the most important form of borrowing and total exposure towards one country was then public information. The price of bonds was usually discounted to compensate for higher risk, and the amount transferred to the governments by the underwriters was usually lower than the proceeds from the sale.[4] Today, international borrowing has been dominated by bank loans (granted by bank syndicates). It was not until the debt crisis exploded in 1982 and governments and multilateral agencies entered the scene, that the total exposure on these countries became visible.

3.- At the end of the 1970s, LDCs artificially appreciated their currencies with the purpose of containing inflationary pressure. This policy led them to over-borrow in the international capital markets.

4.- Defaults have been replaced by rescheduling (forced lending), increasing the size and the duration of the crisis.

Carlos Marichal sustains that debt crisis in Latin America resulted mainly from the fluctuations of the world economy and that debt negotiations not only serve financial purposes but also political ones.[5] What is very interesting to see is the fact that LDCs debt has always been sold at deep discounted prices. The price of Argentine 1984

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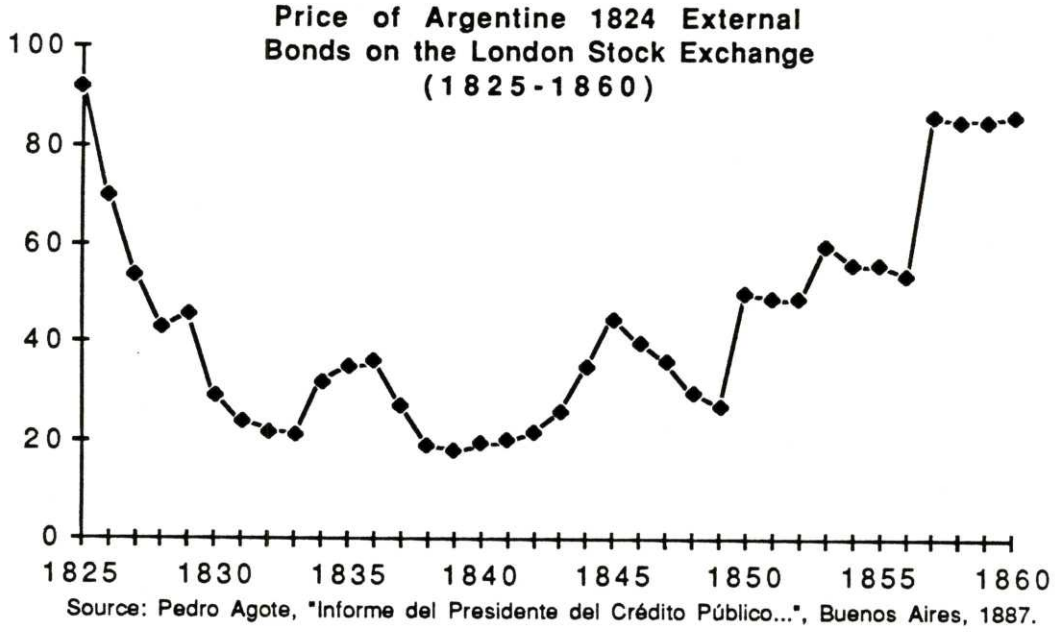
[4] For example, in England, in 1824 Brazilian bonds were sold at 75%, Argentine at 85%, and Mexican at 58%.

[5] See Marichal Carlos (1989).

external bonds on the London Stock Exchange dropped from 92% in 1925 to 18% in 1940 (see Figure 1-1). In 1927 Argentina suspended debt service causing a sharp decline in the price of the debt. It is not until 1943 when debt service is partially renewed that the price started to increase again.

Figure 1-1



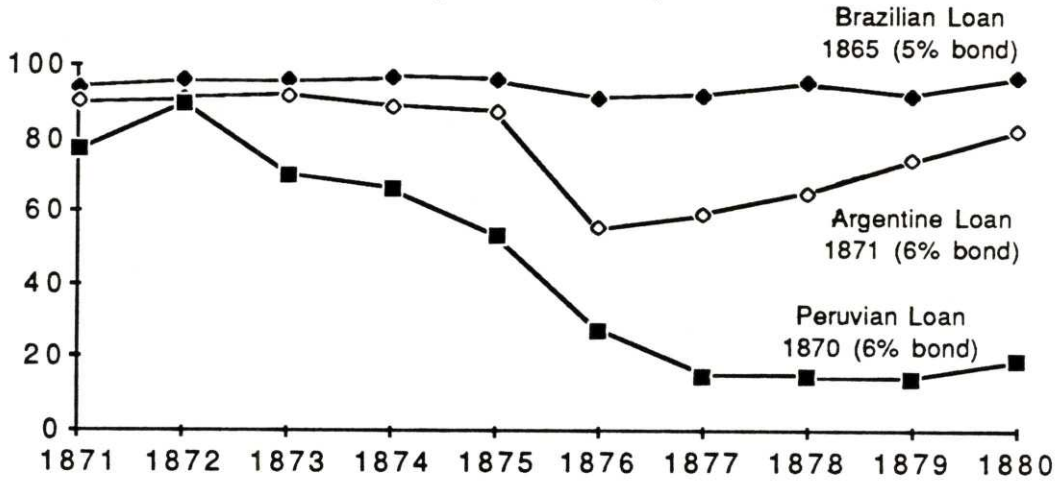
Source: Pedro Agote, "Informe del Presidente del Crédito Público...", Buenos Aires, 1887.

Although the 1870s debt crisis affected most non-industrialized nations, Brazil, Argentina, and Chile were able to continue servicing their debts. On the other hand, Peru suspended payments and the price of its debt dropped to 14% in 1879 (see Figure 1-2).

In the Great Depression, Latin American economies suffered from the decline in the prices of raw materials and the defensive commercial policies adopted by industrial countries (see Figure 1-3).

Figure 1-2

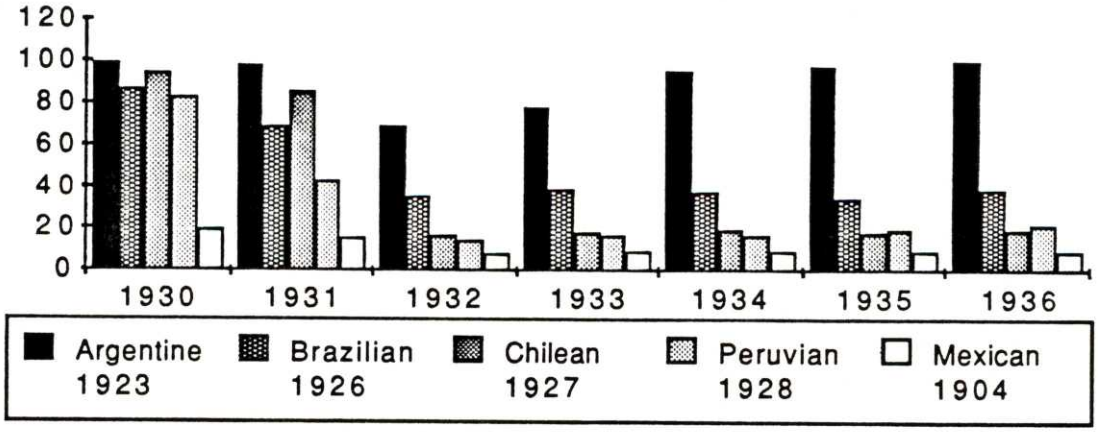
Price of External Bonds on the London Stock Exchange (1871-1880)



Source: Charles Fenn, "Compendium of the English and Foreign Funds", London, 1883.

Figure 1-3

Prices of the Latin American Gold Bonds on the New York Stock Exchange (1930-1936)



Source: Foreign Bondholders Protective Council, Annual Report 1936, New York, 1937.

Chilean exports decreased to 1/6 of their 1929 level, and in July 1931, the Chilean government suspended payments on the external debt. Peruvian exports dropped by 72% between 1929 and 1932, and in May 1931 Peru suspended debt service. Brazil defaulted in October 1931. Mexico defaulted in 1914 as a result of the revolution. Argentina did not default, the Roca-Runciman Treaty served as a stabilizer of exports' income.[6]

1.2 The Market

In August 1982, Mexico announced to its creditors that it was unable to meet debt service payments. The problem was a serious one and it triggered the intervention of the U.S. government and multilateral agencies. Other countries followed declaring an interruption of debt service payments and rescheduling with the Advisory group the terms of their debts. Among the options developed by the Advisory group for each country we find; relending, currency switching, repricing of interest rates, exit bonds, and debt-for-equity swaps. Later, the sharp decline in the price of oil shocked Mexico and other oil exporters (January 1986), Peru announced that it would not pay more than 10% of its exports earnings, and Brazil suspended interest payments on its foreign debt (February 1987). Money center banks reacted with a general write-down of LDCs debt in mid 1987, recognizing that claims

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[6] The Treaty was signed in 1933 and guaranteed a large portion of the English market to Argentine beef exports. In exchange, British firms operating in Buenos Aires were offered the possibility of remitting dividends to stockholders in England.

were worth less than face value (see Table 1-5).[7] This triggered the development of a secondary market for these loans.

The general rescheduling of LDCs loans was also a very important step towards the development of a secondary market. A first order condition for the emergence of a secondary market is the existence of standardized debt instruments (maturity, denomination, coupon) where participants negotiate only the price. This standardization was somewhat provided with the rescheduling agreements. Nevertheless, the market is still characterized by the heterogeneity of the instruments traded (see Table 1-1).

Table 1-1

Heterogeneity of paper traded

Country	Type	Price spread	
Argentina	GRA	18.5	19.5
	Bonods	18	19
	TCA	21.5	22
	TCDF	83	84
Brazil	DFA	34.5	35.5
	Project IV	71	72
	Project III	73	74
Chile	Banco Central	59.5	60.5
	Restructured	59	60
Mexico	Eligible	39.5	39.75
	Ineligible	38	39
	Interbank	59	61

Source: ANZ Merchant Bank Ltd., January 1989.

This market has grown steadily from approximately $100 million in 1983 to at least $20 billion in 1988. Nevertheless prices in this market

[7] Citicorp took 25% provision on its $15 billion in third-world loans in May 1987.

fell systematically. The problem seems to be that the supply of debt far outweighs demand. It is not until 1986 that public quotations of LDCs debt prices became available. A reason for this is the increase in volume and the surge of a debt-for-equity market.

1.2.1 Volume

No one knows exactly what the size of this market is. No transactions are publicized and most of the banks are very secretive about them. Estimates on the market's volume are shown in Table 1-2.[8]

Table 1-2

Secondary Market Trading Volume
(in millions of dollars)

	1984	1985	1986	1987	1988
Argentina	31	469	-	-	338
Brazil	731	537	176	380	2,708
Chile	-	324	987	1,983	583
Mexico	-	-	416	1,804	3,670
Venezuela	-	-	-	-	300
Philippines	-	-	15	266	635
Other	-	-	7	277	666
Total Conversion	762	1,330	1,601	4,710	*a* 8,837
Total Transactions	2,000	4,000	7,000	12,000	*b* 16,000

a. January - June 1988.
b. Estimate for the whole year is $25 - $30 billion.
Sources: IMF, World Bank, Salomon Brothers, Merrill Lynch, International Financing Review, and Business International Corporation.

8 Source: Weinert Richard (1986/87), Business International Corporation (1987), Salomon Brothers, Merrill Lynch, IMF, World Bank, and International Financing Review.

A small number of countries accounted for the majority of the turnover (94% of the volume traded in 1987, and 92% of the volume traded in 1988 was related to Argentina, Brazil, Chile, Mexico, Philippines and Venezuela). The larger volume of transactions is between banks (swapping) and does not reduce exposure.

Most countries have different types of debt outstanding. Usually the capitalization programs specify the types of debt that are eligible for conversion. These requirements increase demand for debt because market makers have to construct a chain of swaps in order to obtain the desired paper. This allows countries that do not have a debt conversion program to exchange debt for cash.

1.2.2 Efficiency

The efficiency of a market will be determined or measured by its degree of depth, breadth and resiliency. A fragmented market emerges when communication costs are significant and when communication lags are long.[9] The existence of bids above the lowest offering price reflects the incompleteness of information. A market becomes deeper, broader, and more resilient the faster investors can acquire and act upon quotation and transaction price.

Quotation on LDCs debt prices vary depending on the source. This is an indication of a fragmented market (see Table 1-3).

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[9] An ideal market is one in which every participant knows at zero cost the trading interests of every other participant. This implies that there will be a unique equilibrium price at any moment in time. But complete information is rarely free and fully disseminated in the real world.

Table 1-3

Indicative Prices for January 1989

	Salomon		ANZ	
Argentina	19.5	20.25	18.5	19.5
Brazil	34	34.75	34.5	35.5
Chile	60	60.75	59.5	60.5
Mexico	38.25	39	39.5	39.75
Venezuela	36.75	37.5	37	38

Source: Salomon Brothers Inc. and ANZ Merchant Bank Ltd.

• Depth: A market is said to have depth if there are orders, actual or easily uncovered, both below or above the price at which the security is trading. Fragmented markets lack depth because offsetting orders may go undiscovered for relatively long intervals of time. So, prompt communication of orders and prompt execution of orders are preconditions for a deep market. The fact that market quotations are cast in terms of bids and offers is also an indication of a thin market.

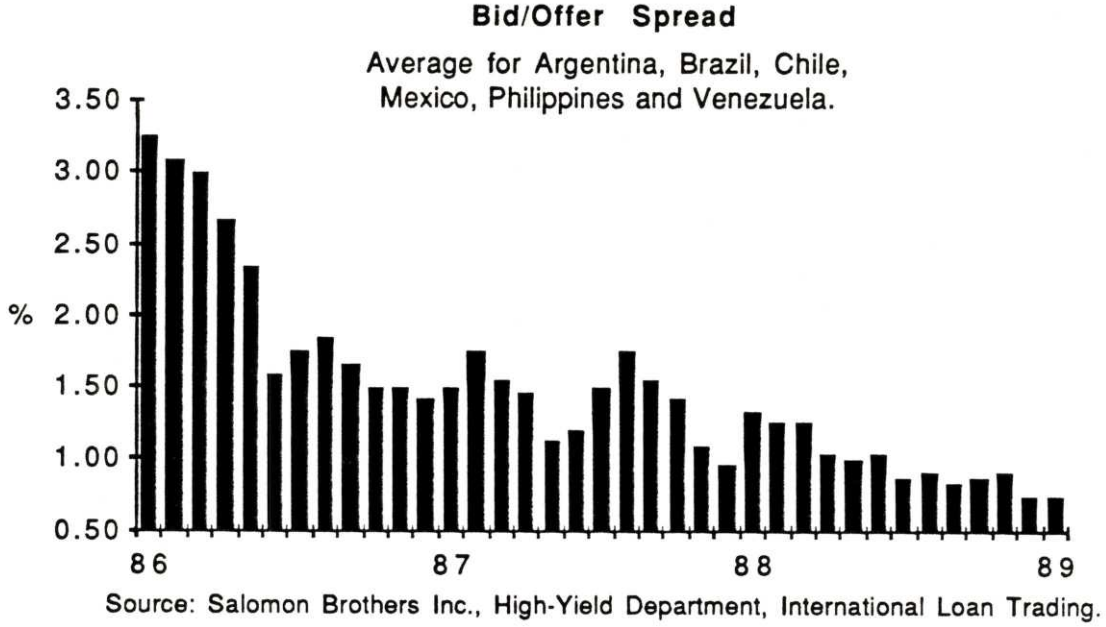
• Breadth: A market is said to have breadth if orders exist in substantial volume. It helps the stabilization of transitory price changes which arise out of temporary order imbalances.

• Resiliency: A market is resilient if new orders pour in promptly in response to price changes that result from temporary order imbalances.

1.2.3 Bid/offer Spreads

In the secondary market for LDCs' debt, the bid/offer spread is measured as a percentage of the face value of the paper, and not as a percentage of its price.

Figure 1-4



Source: Salomon Brothers Inc., High-Yield Department, International Loan Trading.

As we can see in Figure 1-4, the size of the bid/offer spread has decreased over time. Two years ago spreads were 3%-2%. Today they are below 1%, and some banks are even performing transactions for flat fees of \$10,000-\$20,000.[10] All this reflects the fact that the market has grown in volume and has become more efficient. For some countries, the spread has widened reflecting low volume and high volatility.

Table 1-4 shows the bid/offer spread as a percentage of price. It is interesting to observe that this number ranges from 1.65% to 3.94% for the actively traded countries (Argentina, Brazil, Chile, Mexico, Venezuela, and Philippines); while the same range for inactive countries (Peru and Costa Rica) goes from 9.38% to 25.06%, reflecting the higher holding cost due to high volatility and low liquidity.

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[10] Interview with Silvana Keen, ANZ Merchant Bank, held on February 1989.

Table 1-4
Spread and its Relation to price

Country	Year	Average Spread	Average Spread as a % of Price
Argentina	87	1.56	3.23%
	88	1.01	3.94%
Brazil	87	1.83	3.15%
	88	0.92	1.95%
Chile	87	1.21	1.89%
	88	1.10	1.86%
Mexico	87	0.90	1.65%
	88	0.82	1.70%
Venezuela	87	1.35	2.13%
	88	1.02	2.00%
Philippines	87	1.56	2.41%
	88	1.17	2.24%
Peru	87	2.96	25.06%
	88	1.56	24.18%
Costa Rica	87	2.50	9.38%
	88	2.08	14.98%

Source: Salomon Brothers Inc.

1.3 Supply

Commercial banks' policy with regard to LDCs loans is influenced by their ability to establish loan loss reserves and by the eligibility of these reserves to be included as regulatory capital. A bank that has a high level of reserves that are not part of capital can write down loans without impacting regulatory capital.

1.3.1 American Banks

American banks exposure to LDCs decreased significantly from 1982's levels, not only in dollar terms but also as a percentage of capital. The biggest sellers have been the regional banks.

In the United States the level of provisions is influenced by tax deductibility and by the competitive positioning of banks. Provisions are mandatory only if the loans have been declared to be "value impaired" by the Interagency Exposure and Review Committee.[11] Bolivia, Costa Rica, Liberia, Nicaragua, Peru, Poland, Sudan, and Zaire fall into this category. Only mandatory reserves are tax deductible. With the exception of these provisions, all other loan loss reserves are included in regulatory capital.

Table 1-5
Main U.S. Banks Loan Provision to LDCs' Debt
(As of December 1988)

	($ millions) A:Loan	B:Provision	B/A
Bank of Boston	579	359	62.0
First Chicago	2,125	925	43.5
Republic National Bank	430	170	39.5
First Interstate	841	309	36.7
Sepac	852	302	35.5
Wells Fargo	500	150	30.0
Bank of America	9,000	2,500	27.8
Bank of New York	2,300	600	26.1
Chase Manhattan Bank	7,900	2,000	25.3
Bankers Trust	4,000	1,000	25.0
J.P. Morgan	4,600	1,150	25.0
Citibank	12,076	2,876	23.8
Chemical Bank	5,909	1,309	22.2
Manufacturers Hanover	8,357	1,707	20.4
Total	**59,469**	**15,357**	**25.8**

Source: Estimation by Salomon Brothers.

[11] An Asset is considered "value impaired" if: interest payments are six months overdue, there are no immediate prospects for compliance with IMF programs, the country has not met rescheduling terms for over one year, or an orderly restoration of debt service in the near future is unlikely.

Moreover, if commercial banks capitalize interest payments (interest due is automatically relent to the debtor for a later payment), rather than refinance them (involuntary lending), the loans will have to be declared non-performing.

1.3.2 Japanese Banks

Japanese banks favor a public policy solution. Japanese banks are the second largest holders of loans to developing countries. Their exposure in medium and long term loans is estimated around $80 billion.[12] Ten percent of the total exposure is guaranteed and not eligible for provision. Together the 13 Japanese City banks hold around 65% of this total, the 3 Long-term Credit banks hold 15%, the 7 Trust banks hold 14%, and the rest is held by the regional banks (see Table 1-6).

Of the total debt held by Japanese banks, 70% is dollar denominated and 30% is yen denominated. The Japanese proportion of debt outstanding has been increasing mainly because American and European banks have been able to reduce their exposure more easily through the secondary market.[13] Japanese banks have not been active players in this market. In Japan provisioning is mandatory, and loan provisions are included in mandatory capital with the exception of the small part that is tax deductible. Ministry of Finance regulations allow Japanese banks to create reserves equal to no more than 15% of their overseas assets (See

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12 Wall Street Journal, March 15, 1989, and The Economist, March 25, 1989.

13 The 1988 Brazilian rescheduling deal has penalized the Japanese banks because it has changed the method for calculating new money requirements. In earlier reschedulings, banks were asked for new money on the basis of their exposure in 1982, while in this deal, the basis was changed to March 31st 1987.

Table 1-7).[14] Moreover, just 1% of their exposure is tax deductible. Regarding LDCs exposure the Ministry of Finance was even more specific; only 1% of rescheduled loans or net new lending to LDCs after April 1984 can be written off for tax purposes.

Table 1-6
Estimated Break-down of Japanese Debt

	¥ bn.	%
City banks (13)	3,250.0	65.0
Bank of Tokyo	671.3	13.4
Sumitomo Bank	375.2	7.5
Daichi Kangyo Bank	350.0	7.0
Mitsubishi Bank	339.8	6.8
Fuji Bank	313.4	6.3
Sanwa Bank	306.2	6.1
Others	894.1	17.9
Long-term Credit banks (3)	734.3	14.7
Long-term Credit Bank	287.3	5.7
Industrial Bank of Japan	273.6	5.5
Nippon Credit Bank	173.4	3.5
Trust Banks (7)	700.0	14.0
Yasuda Trust	143.4	2.9
Mitsui Trust	138.6	2.8
Mitsubishi Trust	127.3	2.5
Sumitomo Trust	117.1	2.3
Others	173.6	3.5
Regional Banks (64)	315.7	6.3
Total	**5,000.0**[15]	**100.0**

Sources: Mr. Yoshio Kamiya, The Sumitomo Trust. Interview held in Tokyo on the 22nd of February 1989, and International Financing Review, February 4, 1989.

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14 Before 1983 banks were not allowed to create reserves for overseas assets. In April 1983 they were allowed to provision up to 5%. In April 1988 this figure was raised to 10%, and starting April 1989, banks will be allowed to provision up to 15%.

15 The figure I was given in Japan was ¥5 trillion ($42 billion), for 39 countries that were considered LDCs. A similar estimation appears in the International Financing Review, February 4, 1989.

The Ministry of Finance has been very strict with the regulation concerning the creation of reserves. Ten years ago banks had a general reserve of 15/1000, today they are only allowed to hold 3/1000. Banks want to increase their general reserve to 5/1000, but the Ministry of Finance argues that real loss is even lower than 3/1000 and therefore wants to reduce it even further. The main reason for this policy is that banks are very important tax payers in the Japanese society, and the Ministry of Finance does not want to see one of its main sources of income reduced, nor to shift the burden on to less profitable manufacturing firms.

Table 1-7
Bank Provisions on LDCs' Debt

Country	1985	1989
United States: Money Center	5%	23-35%
Regional	5%	50% or more
Japan	5%	15%
United Kingdom	5%	23-35%
France	20%	30-45%
Germany	20%	30-50%
Canada	10-15%	30-40%

In summary, there are five reasons why the Japanese banks were not so active in the LDCs debt secondary market:

1.- They expected the LDCs' economies to recover and they thought there was a lot of potential for growth. They did not see the price in the secondary market as a good estimate for the value of the debt.
2.- The attitude of the Ministry of Finance regarding the creation of reserves and the selling of debt.

3.- For the Japanese banks, new money was a synonymous for international cooperation.

4.- Bank's dollar denominated outstanding debt has been significantly reduced by the appreciation of the yen.

5.- The Ministry of Finance might have doubts about the ability of the banks to control the supply of paper going into the secondary market. A poor control could cause prices to fall even further.

In March 1987 a factoring company, JBA Investment Inc., was set up in the Cayman Islands by 28 Japanese banks (all banks that participated in the Mexico Agreement). Japanese banks can sell (reducing taxable income) part of their exposure to JBA, who will keep the loans. If sometime in the future the LDCs' economies recover, the banks will recover the loss as dividends. JBA acquired Mexican loans in March 1987, Argentine loans in September 1987, and Brazilian loans in January 1989.[16] Japanese banks are asking for permission to factor automatically, unlimited amounts of debt through JBA. Until now, approval from the Ministry of Finance was required.

1.3.3 European Banks

European banks favor interest capitalization or write-off. The appreciation of European currencies against the dollar favored European banks given that a large proportion of the debt is dollar denominated. In Switzerland and the United Kingdom provisioning is mandatory. In Germany and France provisioning is judged by regulators. The Spanish

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16 On January 31, 20 Japanese banks sold ¥73 bn. face value of Brazilian debt to JBA for ¥25 bn.

and Swedish banks have been specially heavy sellers.[17] In Europe loan provisions are tax deductible. This makes their provisions cheaper, allowing them to sell part of their portfolios at a discount. Banks with proper reserves receive better credit ratings, and hence face lower capital-raising costs. In Europe, with the exception of France, all loan loss reserves against LDCs assets are not included in the regulatory capital.

1.3.4 BIS Capital Requirements

The coordination of commercial creditors with different interests and the international harmonization of the tax and regulatory regimes that govern loan-loss provisions policies, could provide great impetus to voluntary debt reduction.

The Bank for International Settlements has taken the first step into this direction. From 1992 onwards, banks willing to continue being major players in the international arena will have to comply with the BIS capital requirements. Assets will be calculated on a risk-adjusted basis. Off-balance sheet items will be included and weighted according to perceived risk. By 1992 a bank's capital must equal or exceed 8% of its risk adjusted capital. At least 4% need to be core capital (Tier 1), primarily tangible common shareholders equity, preferred stock and/or disclosed reserves. The remaining capital (Tier 2) can come from subordinated debt, hybrid capital instruments, undisclosed reserves, general provisions, etc. According to the BIS regulations, loan loss reserves will be included in the supplementary or "Tier 2" capital (see

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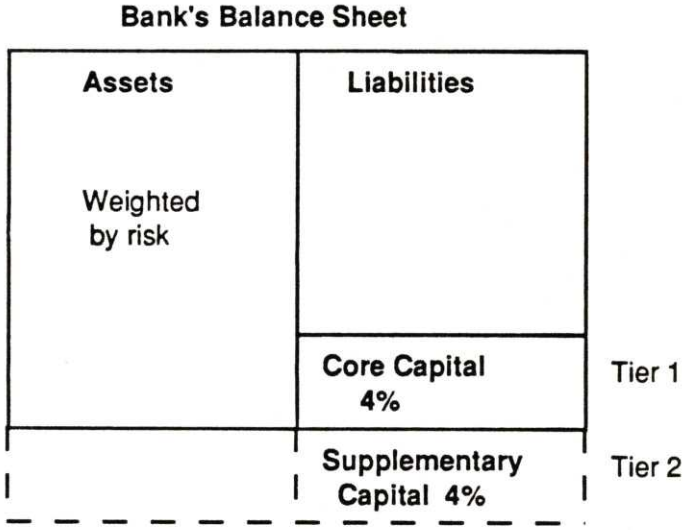
[17] They were instructed by their regulators to make provisions on their LDCs' loans in 1986.

Figure 1-5). All specific provisions should be excluded from regulatory capital.[18]

Figure 1-5

Outline for BIS Proposal for Common Standards on Bank Capital Ratio



By End-1990:
Tier 1 + Tier 2 ≥ 7.25%

By End-1992
Tier 1 ≥ 4%
Tier 1 + Tier 2 ≥ 8%

Tier 1:
Equity Capital (Paid-up)
Disclosed Reserves

Tier 2:
Undisclosed Reserves
Asset Revaluation Reserves
General Provisions (loan-loss)
Hybrid Capital Instruments
Subordinated Term Debt

Source: "International Convergence of Capital Measurement and Capital Standards", Committee of Bank Regulation and Supervisory practices, BIS, 1988.

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18 Specific provisions are the ones that have been created against identified losses or in respect of a demonstrable deterioration in the value of particular assets. They can not be used to meet other losses that may arise somewhere else in the portfolio, and therefore do not meet the characteristics of capital.

This requirements will certainly limit banks' capability to reduce their LDCs exposure by selling loans at deep discounts because it will reduce their ability to absorb losses. Among the major LDCs debt holders, American banks are the worst standing in this terrain.[19] For some money center banks, loan loss reserves make up large shares of their capital, and will have to be excluded in 1992.

1.4 Demand

Demand implies the exchange of existing debt for assets with lower nominal value but lower risk. This can be done in a number of ways. The menu of options has become broader and more innovative to accommodate the diversity of interests and constraints. The options may imply a change in the nature of the claims, a transfer of ownership, or an alteration of the financial profile (interest retiming and long term consolidation).

1.4.1 Debt-for-debt exchanges

Demand for LDCs loans originated with the debt-for-debt swaps. The secondary market for debt was born when some banks realized that by swapping debt of one country for debt of another, they were able to improve the quality of their portfolios without registering any loss (this was possible thanks to historical cost accounting practices). In these transactions the buyer and the seller negotiated the price directly, like in a barter exchange. Rarely the loans had the same value, so a cash payment was required by the seller of the cheaper loan. Some banks

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[19] If Citicorp were to value its loans to Argentina, Brazil, and Chile at market prices, it would lose over $4 billion of its $7.4 billion equity base.

wanted to eliminate some countries from their portfolios, others swapped debt to balance their portfolio, minimizing risk through diversification. Sometimes, to simplify administration and reduce costs, banks reduced the number of countries in its portfolio. Banks would also concentrate their portfolios to increase the exposure on one of its neighbor countries hoping to receive more support from their Central Bank should the loans become non-performing.

In the 1970s, many debtor countries not only participated in the international capital markets as borrowers, but also as lenders. At that time, financial institutions from this countries (private and public) set up branches in New York, London, Bahamas, etc. Brazilian, Mexican, Argentine, Colombian and Venezuelan banks were numerous and active in the Eurodollar market. After 1982, these banks found themselves holding one another's debts. In order to avoid participating in each other's rescheduling efforts they exchanged debts of other countries for what for them was domestic debt. They did this swapping in the secondary market.

1.4.2 Debt-for-equity exchanges

Small regional banks entered the secondary market by selling most of their loans for cash to the debtor countries (and sometimes to other banks). This was possible only when they had sufficient profits to absorb the loss associated with the discounts.

It was not since the implementation in various countries of debt for equity programs, that the volume in the secondary market boosted.

These programs raised political sensitivity toward the foreign ownership of domestic assets. This is why some countries designed their programs as an amnesty to capital flight.

These programs have been used with a variety of purposes. An example is the debt-for-soccer conversion of Brazilian loans. Philips, a Dutch electronics company that owns a soccer club, PSV Eindhoven, used a debt conversion program to acquire a Brazilian soccer player, Mr. Romario Farias, former player for Vasco da Gama.

Table 1-8
Debt-Equity Programs in Selected Countries

Country	Program Status
Argentina	Started November 1987
Brazil	Started March 1988 Suspended January 1989
Chile	Started May 1985 Modified 1987
Costa Rica	Started June 1986
Ecuador	Started December 1986
Mexico	Started April 1986 Suspended October 1987
Nigeria	Started November 1988
Philippines	Started August 1986 Modified October 1987
Venezuela	Started April 1987

1.4.3 Debt buy-back

For the debtor countries the purchase of their own debt at discounted prices was very attractive, but problematic. On one side they were pleading for lower interest rates and extended maturities, and on the other side they were using their resources to retire debt.[20]

[20] See Rodriguez, A. Carlos (1988).

Today, discounted debt buy-backs are part of the menu of options to negotiate with creditors. The discounted price at which these transactions take place are usually higher than the market prices, making the countries share some of the burden.

In January 1988, Bolivia bought back a face value of $334 millions of commercial loans at 11 cents. An amount of $262 millions was bought for cash and the net of $82 millions was in the form of collateralized investment bonds (25 years, zero-coupon, Bolivar denominated, dollar indexed bonds). Official donors provided the cash to finance this operation. The price of the Bolivian debt increased after the debt buy-back.[21]

Chile agreed to use $500 millions of the increase in export earnings to buy debt back in the secondary market.

In March 1988, Mexico retired long term debt for $3.67 billions at 69.75 cents and issued a 20-year bond for $2.56 billions, 100% collateralized by 20-year zero coupon U.S. treasury bonds. The collateral will be kept in a trust account and used as a collateral for the principal. The new bond has interest rate risk only, so it will be sold at a lower discount. This strategy had two major problems. The first one is a pricing problem. In a context of universal reschedulings, investors may not be paying too much attention to principal risk. The second problem is common to any debt defeasance transactions, and is that the country has to buy the collateral. It cost Mexico $492 millions to buy the collateral.

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21 In 1986 the price of the Bolivian debt was steady around 6/8 cents, due to very little activity. In 1987, the price increased to 9/12 cents due to rumors on the debt buy-back. When the buy-back took place the price increased to 13/14 cents. Later on it stabilized at 10/11.

1.4.4 Exit Bonds

Loans can also be securitized by issuing bonds with long maturities and low yields. By doing this banks get pooled out of the commitment of new money. This can tempt small banks to sacrifice returns and maturity. These bonds are usually issued at fixed interest rates. There are some basic constraints on the securitization of LDCs debt:

1.- Sovereign debt cannot be effectively collateralized.

2.- Sovereigns are large and they may hold bargaining power over creditors. This power derives from the concentration of risk.

3.- The bilateral approach to debt negotiations.

The exit bond option has not been very attractive because it is very difficult to price these instruments. The first country that tried this was Argentina in August 1987.

1.4.5 Debt-for-commodities exchanges

Most of these countries have their exports income concentrated in a few key goods, which in general will have little or none value added (commodities). The price and the volume of their exports depend on the world economy.

Countries can gain by shifting debt service from circumstances in which export prices are low to circumstances in which export prices are high. This can be done by linking debt service to commodities prices and it does not represent a loss to creditors.

1.4.6 High yield security

The LDCs debt is a high yield investment. Individual and institutional investors can capture a high yield of return from investing in LDCs debt. A loan bought at 30% of its face value that pays 10% in interests will yield 33% annually. Of course, the risks associated with this return are very high. In addition we have to take into account possible capital gains or losses, and the probability that a country will default interest payments. The owner of the debt may also be obliged to contribute new money. All this may significantly reduce his return.

One way of avoiding these risks is through the application of debt swaps to the formation of stock funds. The way to do this is by buying debt at a discount, converting it into local currency and investing in the local stock exchange. When combined with a debt swap, stock market investments offer a good profit potential.

1.5 Price

We can identify three reasons for the change in price of debt:

1.- A change in the required yield due to a change in the credit quality of the debtor. The price of the existing debt summarizes the market's current evaluations of the debtor's situation.

There are two components of credit quality: ability and willingness to service debt. We will assume that a debtor's willingness is determined ultimately by his ability to service debt. Measuring willingness is very difficult. It can be done ex-post, accounting for whether a country is in fact servicing loan principal and interest but, in this way, we won't be measuring willingness and instead we will be looking at the combined result of ability and willingness. In order to measure willingness we will

have to consider the ideology and the mix of political and economical goals that a government has. We can try to assess this by considering official declarations and political statements. But what I sustain here is that these declarations will be shaped by the country's ability to pay. The willingness to service foreign debt has always been associated with its macroeconomic viability. Historical examples show that politicians fully repaid their country's external debts whenever they could, even if not economically convenient.[22] By doing this they were viewed as the liberalizers of the tyranny of foreign creditors, gaining independence from foreign powers' economic imperialism.

2.- Proximity to maturity. For every bond selling at a premium or at a discount, its price will change (for a given required yield or credit quality of debtor) simply because the bond is moving towards its face value.[23]

Nowadays, debtors are not in a position to amortize their debts. The distinction between long-term and short-term debt is becoming irrelevant. Since most of the LDC debt has been rescheduled, the concept of maturity has lost significance.

In the case of the LDCs debt, in general, commercial banks have been short-term creditors and official lenders long-term creditors. Up to the 1982 debt crisis the proportion of short-term debt was increasing. Since

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22 The Argentine president J.D. Peron, continuing a policy already started by Raul Prebisch in the 1930's, fully repaid the external debt in 1948.

23 Example: Assume interest rates don't change. If a bond is selling at par, its coupon rate is equal to the required yield and the price of the bond will remain constant as the bond moves towards maturity. If a bond is selling at a discount, its required yield is higher than the coupon rate and the price will increase as the bond approaches maturity. The price will be equal to the par value at maturity.

then it has been decreasing due to the increase of official lending and the rescheduling of short-term debt.

3.- Change in the yield of comparable bonds. Here we have to take into account that most of the LDC debt is on a floating rate basis, and avoids the effects of changes in the general levels of interest rates.

1.5.1 Price and value

"*Solo el necio confunde valor y precio*", Antonio Machado

The contractual or face value of debt can be defined as the present value of the stream of payments (interest and principal) set out by contract between debtor and creditor, under the assumption that the payments will be made with certainty.

The market valuation of the same debt takes into account the market's expectation on this stream of payments, namely the probability of facing defaults, rescheduling, interest arrears, principal partial write-down, etc. The market value of existing debt reflects the market's perception regarding the country's ability and willingness to pay, it summarizes the forecasts or expectations of many actual and potential creditors. Embedded in the market's valuation is the complex interaction between debtors and creditors, as well as the conflicting interests among various types of creditors.

The fact that most of the debt is in the form of loans and not bonds (only 10% is in bonds) has some implications for the price formation process. Bond lending is more risky because it is very difficult to renegotiate the terms of debt, and because it is hard to gather all the

bond holders and to have them agree in something.[24] That is why bond spreads reflect the probability of default while loan spreads reflect the probability of rescheduling. The negotiation process where rescheduling is discussed, is one of bilateral bargaining between a banking cartel and the countries. Market prices reflect the marginal banks' decision to abandon the cartel and the shrinking expectations of success of debt negotiations.

Most of the major banks' LDCs portfolio management policies are driven by the market's valuation of their policy, reflected in the price of their stock. Since the deregulation of the banking industry, banks have been competing more aggressively and the stock market, rather than the Central Banks, has been the most influential controller of the banking system.[25] When deciding whether or not to sell the debt, banks pay attention to the costs and benefits of the whole transaction, to the synergies that the transaction may have with the rest of the balance sheet. The stock market valuation of commercial banks closely reflect the secondary market valuation of the LDC exposure.[26] So, when banks see that their returns are greater that what the market is expecting, they use the excess return to reduce their exposure. This is what happened in December 1988 when most of the American banks saw their fourth quarter results increased by Brazilian sudden payment.

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24 One can also argue that it is easier and cheaper for many of the major creditors to collect information (specific risk and systematic risk) about what is going on in the debtor countries. Moreover, the fact that the IMF has been acting as a pivot for the rescheduling of commercial bank debt, provided them with cheap information.

25 An indicator of this is that they are being ranked by profits and not by size.

26 A significant negative effect of LDC exposure on bank share prices was found by Kyle Steven C. and Sachs Jeffrey D. (1984).

If a bank increases the exposure on LDCs the market will react negatively, even if the investment is a very profitable one. As an example, we see that the market does not distinguish between old and new debt, even when new loans haven't been defaulted on and are a great business for the bank.

Another interesting aspect to consider is that the demand may be valuing the debt by considering the use that will be given to it and the return that will be obtained. For example, if the debt is to be used in a conversion program, the timing of the transaction, the exchange rate at which it will be converted, etc, are all factors that can affect the return of the transaction.[27] For example, the value of a country's debt, other things equal, will be higher with the existence of a debt for equity program than without it.

A unique characteristic of this market is the influence that negotiations between debtor and creditor have on the price formation process. Negotiations may affect the present value of future payments and though the market price of the debt because:

- They may change expectations on the certainty of payments. This is the same to say that the perception of country risk increases.
- They imply a change in the initial contractual terms of the debt: spreads over base rate, maturity, payment schedules, etc.

The initial response to the 1982 debt crisis interpreted the situation as one of temporary illiquidity. The approach was to try to buy time through the restructuring of national debts. Even though multilateral

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27 For example, the Argentine conversion program allows you to wait 18 months before starting the investment project. During this time the Central Bank guarantees you the full payment of interests on the debt to be converted. This certainly increases the return of the conversion.

agencies enter the scene, net resources transfers became negative because commercial lending plummeted. For the debtor countries, the external adjustment took the form of lower growth and falling output.

The Baker initiative of 1985, stressed that only a combination of growth, structural reform, and new lending could bring a solution to the debt problem. This plan failed because banks did not understand that new loans would have strengthen the total value of their claims. They considered the new money that they would have contributed individually, and did not take into account the effects of the total contribution.

Trading practices account for a lot of the movement in prices. The fact that prices have been declining constantly in the market and the fact that the market is still a fragmented one, tempted traders to try to arbitrage the market. A strategy called *dealer bottom fishing* is used to buy debt at bargain prices to construct swaps. The number of short sellers and roll-overs is large, creating fictitious price levels.[28] In a market where the demand is mostly for conversion, only a few types of debt are eligible, and auctions by the Central Banks are conducted once every month or every quarter, the behavior of price can fall into a cycle. Investors might wait until the last possible moment to buy the debt, on the expectation of a further drop in price. This would accumulate purchases near the auction date or the deadline to present the paper at the Central Bank. In some of these markets a repos market has developed and serves as a price stabilizer.

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28 When the Brady Plan was announced, prices increased in the expectation of debt relief, and many traders lost money covering their short positions.

Chapter 2 - Price Determination

2.1 Technical considerations

I have modeled the secondary market for LDCs debt through the use of standard regression analysis. Secondary market price quotations are available from the end of 1985 onwards. This limits the number of observations on our regression to twelve quarters (1986 to 1988). In order to solve the statistical insignificance that such a small sample can bring, I utilized the technique of pooling cross-sectional and time series data, also called panel data. In this way, I improved the efficiency of my estimators.

This methodology has several advantages over conventional cross-sectional or time-series data techniques:

1.- Provides a larger number of observations or data points, increasing the degrees of freedom and reducing collinearity among explanatory variables. Improves the efficiency of econometric estimates. The observations for a country across time will be treated as distinct data points.

2.- Allows the construction and the testing of more complicated behavioral models.

3.- Provides a means of reducing or eliminating the effects of missing or unobserved variables, a key econometric problem that often arises in empirical studies.

2.2 The Sample

The countries that I included in the sample are those whose debt is actively traded in the secondary market. Peru's debt has a price of 6%,

but at this price there are no transactions, there are no buyers or sellers. It would be meaningless to work with this country. The countries selected are: Argentina, Brazil, Chile, Mexico, Venezuela, and Philippines. An important consideration in the selection of the countries was the existence of a debt conversion program. Even before the existence of debt-for-equity programs, these countries were actively traded in the swaps market. These six countries systematically accounted for the majority of the transactions done in the market.[29] The combined debt of these six countries adds to 70% of the total debt of the Highly Indebted Countries (HICs).[30]

2.3 The Variables

The sign in parenthesis denotes the impact of the variables on the loan prices.

2.3.1 Price of LDCs debt in secondary market

The main source of information was Salomon Brothers' publication "Indicative Prices for Less Developed Country Bank Loans" (see Figure 2-1). It is important to mention that these values do not correspond to monthly averages, they are indicative prices that are published twice a month. It is also important to remember that each country offers a variety of instruments such as private or public sector debts, rescheduled or non-rescheduled debts, etc. (see Table 1-1). Here we assume that the prices of the individual instruments move in tandem.

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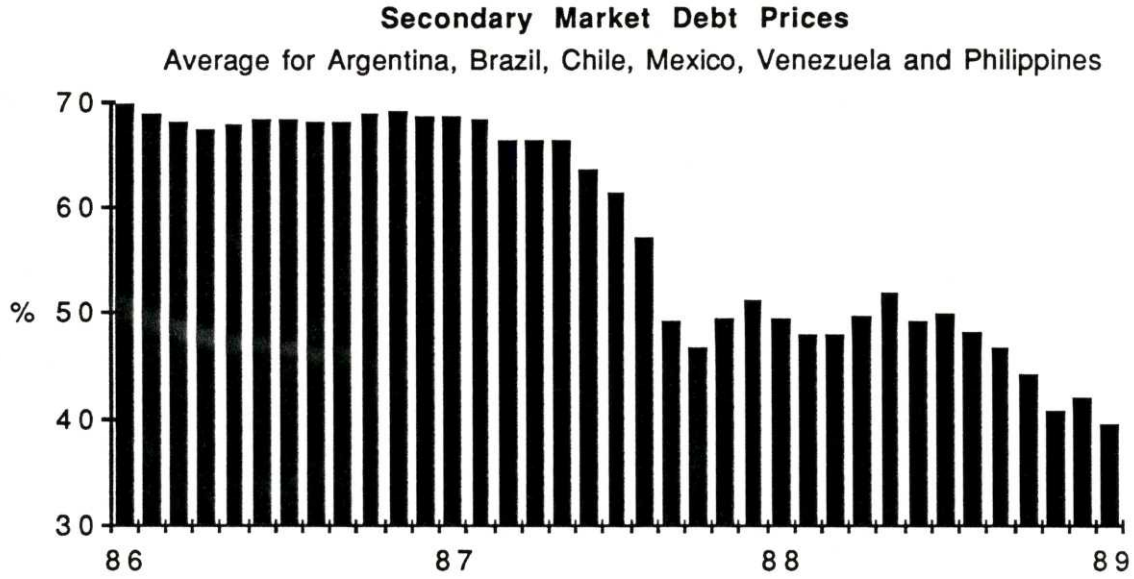
[29] Other countries that could have been included are Nigeria, Poland and Yugoslavia.

[30] In this group, the World Bank also includes Bolivia, Colombia, Costa Rica, Cote d'Ivoire, Ecuador, Jamaica, Morocco, Nigeria, Peru, Uruguay, and Yugoslavia.

Figure 2-1



Source: Salomon Brothers Inc., High-Yield Department, International Loan Trading.

2.3.2 Country specific variables

This first group is formed by those variables that are specific to one country.

1.- Total external debt / Gross National Product (-)

It seems natural to focus on external debt, but it is all the existing debt of residents (private, official, internal and external) what represents a claim on the future outcome of the country. This ratio measures the internal generated payment capacity and can be very erratic because dollar GNPs are difficult to calculate (most of these countries have multiple exchange rate systems) and because international comparisons of GNPs have become difficult due to different baskets of goods with

different relative prices.[31] In order to solve these problems, I took the U.S. dollar figure for 1987 from the World Debt Tables and then adjusted this figure with the annual real growth rate in order to obtain annual GNPs. Quarterly GNP growth rates are available for Argentina, Chile, and Philippines. For Brazil and Mexico an Industrial Production Index was used to adjust GNP. Venezuela's GNP was adjusted using an oil production index.[32]

Total external debt figures were taken from the World Debt Tables and include public and publicly guaranteed long-term debt, private non-guaranteed long-term debt, short-term debt and the use of IMF credit.[33] Quarterly figures were obtained using a linear estimation.

2.- Net Debt / Exports of goods and services (-)

We defined Net Debt as Total External Debt minus International Reserves. This ratio measures debt burden in relation to exports income. The higher the level of debt, the lower the level of reserves, and the lower the level of exports, the lower will be the price in the secondary market. This ratio can be used as a proxy for Total External Debt / GNP. When using the panel data technique, the GNP denominator may be important in explaining cross-sectional differences. International

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[31] At the end of the 1970s, LDCs artificially appreciated their currencies as an anti-inflationary policy. Since 1982 dollar GNPs have declined for most debtor countries as a result of a large real depreciation. Our analysis starts in 1985 and, hence, avoids dealing with this problem. But, still, during the years that we are studying, large variations occurred in the foreign exchange rates of these countries.

[32] This might be a very inaccurate adjustment since Venezuela under-reports oil production to avoid the OPEC quota arrangement.

[33] Includes loans from international organizations, governments, suppliers, financial markets (loans and bonds), and other sources.

Reserves were defined as Total Reserves minus gold.[34] The data was taken from the International Financial Statistics, row (1l.d). Brazil's 1988 fourth quarter reserves were estimated using the cash concept data published by the Central Bank of Brazil. The data for Exports f.o.b. was taken from the International Financial Statistics, row (70..d).

3.- International Reserves / Imports of goods and services (+)

It tells us the size of international reserves relative to imports. The higher the level of international reserves and the lower the level of imports, the higher the price of the debt in the secondary market. Imports f.o.b. were taken from the International Financial Statistics, row (71.vd).

4.- Short-term Debt/Long-term Debt (-)

This ratio describes the structure of debt. It tell us the proportion of total debt that matures with in one year. The higher the proportion of short term debt, the greater the uncertainty regarding the country's ability to pay principal. The higher the ratio the sooner the liquidity problems and the higher the probability of rescheduling. The information on the structure of debt was obtained from the World Debt Tables.

5.- Real Exchange rate (+)

It is given by an index of nominal exchange rate (local currency per dollar) divided by the ratio of local price index to U.S. price index. An

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[34] Total Reserves minus gold = U.S. dollar value of monetary authorities' holdings of SDRs + Reserve position with the fund + foreign exchange.

increase in the real exchange rate implies a real depreciation, which should result in an improvement of the balance of payments. The inappropriate exchange rate policies followed by some of the indebted countries, that resulted in a real appreciation of their currencies, played a major role in the process of over-borrowing. The index used was the Real effective exchange rates (1980-82 average = 100), published in the World Financial Markets, J.P. Morgan.

6.- Exchange rate differential (-)

The percentage difference between parallel and official exchange rates measures the demand for foreign exchange that is not accounted for in the balance of payments (it is a proxy for capital flight). This differential reflects the expectations on the future movements of the exchange rate, then, for a given rate of return in local currency, it determines the direction of the capital flows.

The following equation will determine the inflow (hot money) or outflow (capital flight) of capital or foreign exchange.

$$\frac{(1 + \text{domestic rate of return})}{(1 + \text{expected rate of depreciation})} = \text{Expected rate of return}$$

When the differential is too large, there is an incentive not to report exports to the government in order to get the foreign exchange at the free market rate. This is another way in which capital flight takes place. The existence of such a differential can also have effects on the attractiveness of the debt conversion program. In most of the conversion programs, the Central Bank converts debt into the local currency at the official exchange rate. Then, in order for the conversion

to be profitable, the differential between the discount at which one buys the debt and the discount at which one sells the debt to the Central Bank must be greater than the spread between the official and parallel exchange rates. Quarterly averages of the official exchange rate were taken from the International Financial Statistics, row (we). Parallel exchange rates were obtained from the Economics Department of J.P. Morgan.[35]

7.- Inflation (-)

We defined inflation as the quarterly rate of change in the Consumer Price Index, expressed in percent.

This variable is a proxy for a country risk index. Inflation is not only a problem in itself, but it also serves as a thermometer for an economy. If inflation is high, the economy is sick. High inflation is associated with economic mismanagement and instability.

This variable is a proxy to Fiscal Deficit / Gross National Product. Lack of timely data on fiscal deficits prevented me from testing this variable. The larger the fiscal deficit, the less resources the government will have available to service the external debt, so, its ability to pay will be reduced.

The relationship between the Fiscal Deficit and the External debt is both ways; (1) large deficits can increase the external debt and (2) viceversa. (1) A fiscal deficit can be financed by borrowing internally or externally. In addition, large borrowing by the public sector can increase interest rates and crowd out the private sector borrowing into

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[35] Interview with William Van Dyke, J.P. Morgan.

foreign financial markets. Moreover, a large public deficit may increase capital flight because the private sector may perceive the deficit to be unsustainable and leading to inflation and devaluation and then move their capital into foreign assets.

(2) The increase in international interest rates increases the debt service burden on public finances.

Debt-for-equity programs are also limited by the inflationary effects of excessive domestic liquidity. The Argentine and Brazilian Central Banks set limits for the conversion auctions they run periodically in order to keep this source of monetary expansion controlled. In January 1989 Brazil suspended its program as part of an anti-inflationary program. Mexico did the same in October 1987.

An investor will buy debt from a bank and will sell it to the Central Bank of the indebted country. The Central Bank will cancel the debt with the bank and will give the investor local currency in return. In doing this the Central Bank will be expanding the money supply and creating inflationary pressures. To avoid this the Central Bank can sterilize this transaction by selling public debt. In this case, it will be swapping external debt for internal debt. Only in the case where the debt conversion is combined with privatization of a public company, or when it is used to cancel on-lending, the monetary expansion can be avoided.

Most of the countries in the sample have no further access to the world financial markets.[36] Some of them, like Brazil and Argentina, have their local markets tapped with domestic debt. With no other source of

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36 Venezuela might be the exemption.

financing left, these countries had no choice but to print money in order to pay their bills. This monetary expansion translates into inflation.
Inflation will also convey information about the amount of new money received by the countries. Lets assume the operational deficit is balanced, total debt service is $5 bn, the trade balance is $3 bn, and new money is $2 bn. The government will have to buy the $3 bn from the exporters and will do so by printing money.
Data on the consumer price index was taken from the International Financial Statistics, row (64).

8.- Debt service accomplishment

A number of different variables can be used to test this concept.

• Interest arrears (-): will take the value zero if the country is up to date with interest payments, one half if arrears are evident, and one if no interests have been paid for the previous three months or payment suspension was announced. This information was collected mainly from the media and interviews with traders.

• New money (+): Banks are forced to lend as part of rescheduling. This variable will measure the amount of new money from commercial banks as a percentage of total debt. This information is compiled by the IMF. The initial response should be positive because it will alleviate short term liquidity problems.

• Rescheduling (-): takes the value zero if any portion of their outstanding debt has been rescheduled since 1982. For the specific sample considered in this thesis, the value of this variable will be consistently zero because all countries rescheduled their debts since 1982. Therefore the variable will not have statistical significance.

Another way to capture this effect is to take the amount of debt rescheduled (accumulated since 1978) as a percentage of total debt. The response should be negative on the loan prices because the greater the amount of rescheduled debt, the more adverse the external situation of a country.

In an environment of universal rescheduling, we should only focus on interest payments. When considering interest payments we should take into account scheduled payments versus actual payments. The difference will reflect the accumulated arrears. Ratios like debt service over exports and debt service over debt can lead us to the wrong conclusions because they will improve with interests arrears and rescheduling. In general, during 1987 arrears were built-up and during 1988 they were reduced.

9.- Gross National Product per capita (+)

Measures overall standard of living, stability of the social environment. A country whose income per capita is decreasing will have less chances to maintain its macroeconomic equilibrium while paying its debt. Data on population was taken from the International Financial Statistics and The Economist Intelligence Unit Country Reports. Quarterly figures for population were obtained using a linear estimation.

10.- Debt-for-equity swaps program (+)

The effects on demand of a debt-for-equity program can be measured by the amount that is converted every period. It reduces the level of debt and, hence, reduces interest payments. In the absence of this information, a dummy variable can be used to reflect the existence of

such program, it will take a value of one if there is an active and significant program and zero if there is no program.[37]

11.- Existence of an IMF program (+)

Adjustment efforts can turn around troubled economies, but they often face internal opposition. The multilateral financial institutions play a catalytic role, they facilitate the agreement between debtor and creditor. We can use a dummy variable that will take the value one if the country is under a Stand-by or Extended arrangement with the IMF, and zero otherwise. It will reflect the government's willingness to stabilize. Information regarding these arrangements is available in the International Financial Statistics.

12.- Political situation (+)

This will be a dummy variable that will take the value zero if there is a democratic government and one if there is a dictatorship or military government. It is really hard to tell whether this variable will add to our explanation. I really think, that the willingness to pay will depend more on the economic possibilities than on the type of government. It is true that military governments tend to have better relations with foreign creditors, while democratic governments tend to politicalize this relationship (independence, sovereignty, etc). Military governments are less sensible to union demands and sectorial political pressures on foreign exchange policy. The particular characteristics of the sample and

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[37] See Business International Corporation (August 1987) and Salomon Brothers (May 1986).
Debt-For-Equity Swaps: A Country-By-Country Update on Market Characteristics and Regulatory Initiatives.

period I am working with, will difficult the interpretation of the results. Argentina, Brazil, Mexico, Venezuela, and Philippines have had democratic governments during the period considered. Chile is the only country that has had a military government. The fact that in any of these countries there was a change in the type of government during the period considered, will affect the interpretation of the results. The variable will just be explaining differences among the countries, that may or may not be related to the type of government. Furthermore, what matters here is the quality of the government and not the type of government.

Table 2-1
Debt and Democracy

Country	(a) Jan 86	(b) Jan 89	(a)-(b) Decline	Type of Government
Argentina	65.00	19.88	45.12	Democratic (Dec 1983)
Brazil	75.75	34.38	41.37	Democratic (Jan 1985)
Chile	68.50	60.38	**8.12**	**Military** (Sep 1973)
Mexico	69.50	38.63	30.87	Democratic (1930's)
Venezuela	80.00	37.13	42.87	Democratic (1958)
Philippines	59.50	46.63	12.87	Democratic (Feb 1986)

2.3.3 Model specific variables

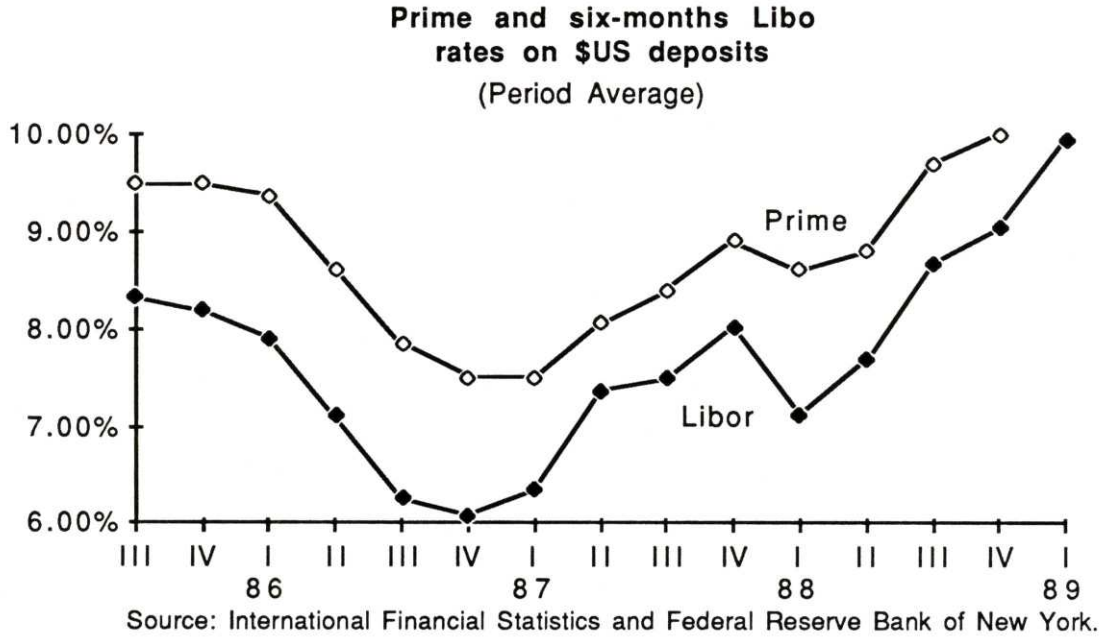
This second group includes those variables that may be the same for every country in the sample.

1.- International interest rate (-)

Developing countries cannot affect the world interest rate. The cost of foreign funds obtained from abroad is formed by two elements: the risk free world interest rate, and a country risk premium related to the probability of default or rescheduling. But the true risk associated with lending to developing countries is not reflected in the interest rate

charged by banks.[38] Moreover, spreads over Libor have been significantly reduced in rescheduling agreements.

Figure 2-2



Source: International Financial Statistics and Federal Reserve Bank of New York.

The six months dollar Libor is the basic reference rate for all the developing countries commercial debt.

The fact that most of the debt is denominated in the creditor's currency and on a floating rate basis, increases the debtors risk. The debtor will face both foreign exchange risk and interest rate risk. Hedging techniques can be used to reduce both, the exchange rate exposure and the interest rate risk. This will improve significantly the debt servicing capability.

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[38] Yields on LDCs' bonds capture this risk.

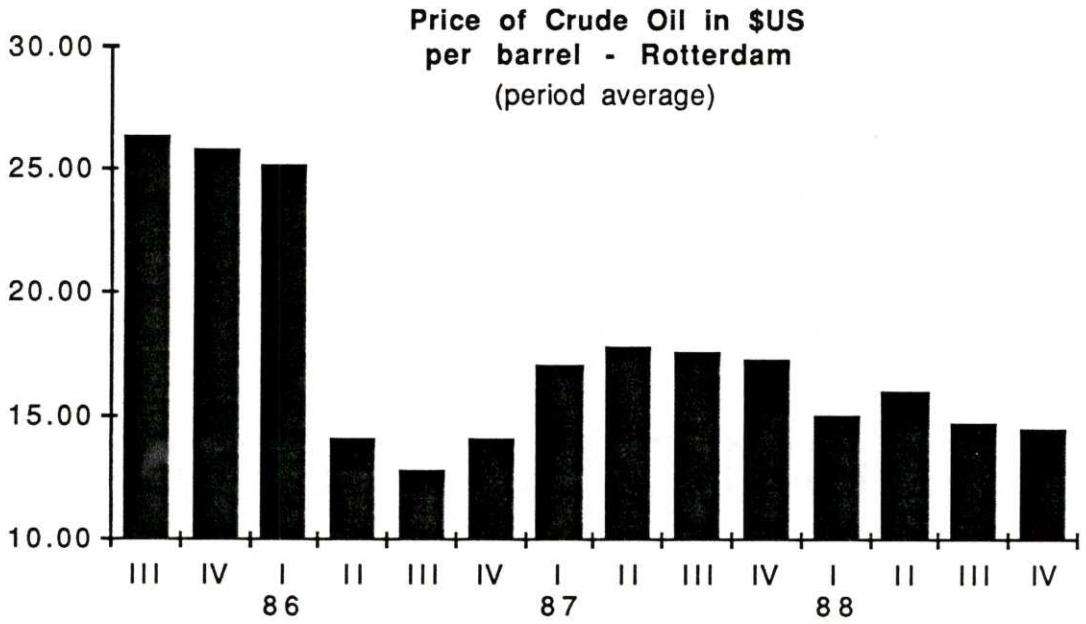
2.- Commodity Prices

The fact that these variables may affect different countries in different ways lead me to create country dummies to explain the effect on each of the countries separately.

• Price of oil

Two of the countries in the sample are oil exporters (Mexico and Venezuela) and their ability to pay is very much affected by the price of their major export commodity. The other four countries are classified as middle-income oil importers, and their foreign accounts are also affected by the price of oil.

Figure 2-3



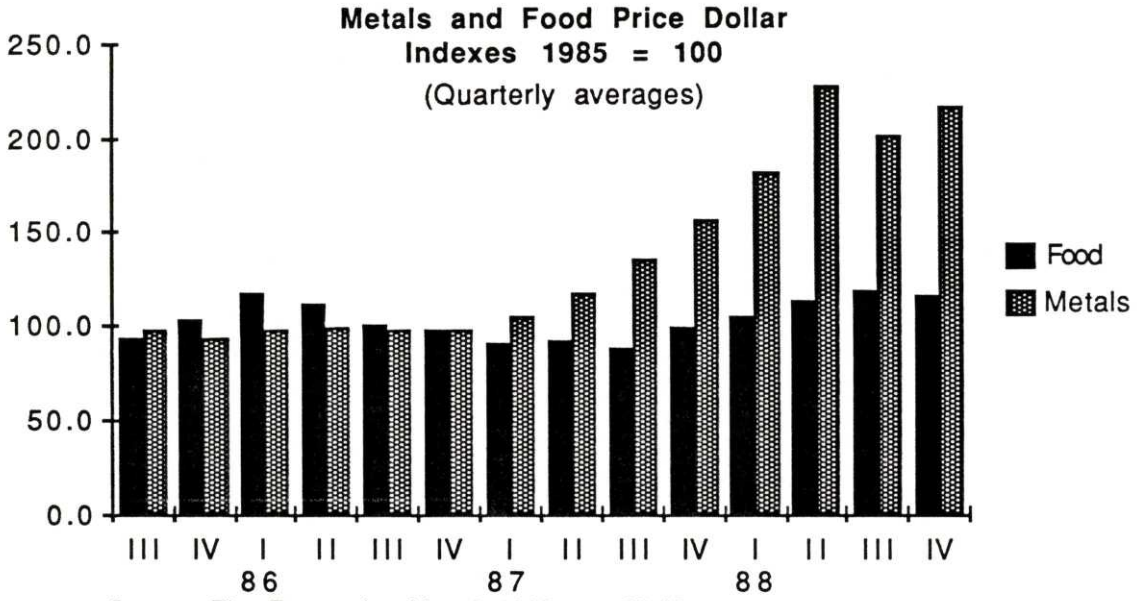
Source: Platt's Oilgram Price Service

• Food Index and Metals Index

A food index will consider the fact that most of these countries are food exporters: Brazil (coffee), Chile (fruits), and Argentina (soya bean). A

metals index (excluding precious metals) will account for Chile's exports great dependency on the price of cooper.

Figure 2-4



Source: The Economist, May 6 1989, pp. 68-69.

Food: Beef (6.7%), Lamb (2.1%), Wheat (4.9%), Maize (8.5%), Coffee (33.3%), Cocoa (10.7%), Tea (3%), Sugar (8.1%), Soya bean meal (7.6%), Soya beans (10.3%), Soya bean oil (1.1%), Groundnut oil (0.7%), Coconut oil (1.4%), and Palm oil (1.6%).
Metals: Copper (28.4%), Lead (4.4%), Zinc (9.9%), Tin (6.3%), Aluminium (41.8%), and Nickel (9.2%).

The strong industrial growth of 1988 make it difficult for metals producers to keep pace with demand. Output of copper and zinc was interrupted by strikes and other disruptions, prices ended the year at new highs. The U.S. suffered the worst drought in 50 years, its grain harvest fell 27%. Maize and soya beans prices rocketed. In contrast beverage prices were depressed. Coffee prices fell reaching the lowest point in August. Later, in December, fears that dry weather in Brazil would cut the 1989 crop boosted prices.

3.- Investment / Gross National Product (+)

This variables captures the countries' perspective for future growth. Although both, per capita income and consumption have fallen, the adjustment burden has fallen mainly on investment. The market valuation of the debt may have been an important factor in discouraging investment. A government needs tax revenue to service its debt (internal and external). Sometimes, the degree of indebtedness is so big that the maximum tax revenue is insufficient to service the debt.[39] Return on investment depends on future tax rates, so the higher the level of debt , the lower the level of investment. Also, since a new creditor can not be differentiated from existing creditors, potential investors may be afraid that the market value of their new claims would become identical to the value of existing claims. The development of simpler and more standardized contracts may facilitate trading in the secondary market, making these contracts more attractive to creditors. However, if the debtor were unable to satisfy the terms of the contract both, debtor and creditor would be uncertain on how to resolve the situation. A key determinant of the current debt crisis is the lack of legal structure to handle these situations. The failure of investment to recover and the declining support from commercial creditors are mutually reinforcing.

The investment data for each of the countries in the sample was hard to obtain. I used the figures published in the World Debt Tables for Highly

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39 The country might be at a point where increasing the tax rate would not increase the tax revenue.

Indebted Countries as a proxy (the countries in the sample account for 75% of the GNP of the HICs).

4.- Industrial countries' growth and World trade growth (+)

There is a positive correlation between industrial countries' growth and world trade growth (a high rate of growth in the industrialized world will result in an increased demand for the exports from debtor countries), but the effects on the indebted countries is less clear. Historically the United States has been the defender of free trade and the most important trade partner of Latin America, but today it has a huge commercial deficit. As a consequence of this, the world is moving toward the formation of trading blocks. The effect that an increase in the world trade growth rate will have on Latin America will depend on the role this area will play in the new world of trading blocks.

The World Bank sustains that there are still strong biases against imports from developing countries (clothing, textiles, fruits, etc.). Industrial countries have also increased the use of non-tariff barriers to discriminate against imports from developing countries.

Information on these two variables was taken from the World Bank.

5.- Level of loan loss provisions (-)

This variable reflects the financial market's confidence in the debtors' ability to pay. Different countries have different regulations regarding the build-up of loan loss reserves. The fact that each debtor ows money to different creditors with different reserve levels is hard to take into account. In May 1987, Citibank announced a sharp increase in reserves. Soon, all major banks followed. In order to account for the effects of this

policy on price, I will use a dummy variable that will take the value zero up to May 1987, and the value one thereafter. An increase in the level of loan loss provisions would have an adverse impact on market prices.

6.- Volume of debt traded

An economic model of a market would not be complete without information on price and quantity. This variable will capture the estimates on volume for the secondary market. Market participants are very secretive with volume data and number of transactions. In Table 1-3, I presented some estimates on market size. The volume of debt traded grows consistently, so we expect a strong negative relationship with price and with bid/offer spreads, and a positive relationship with the existence of a debt for equity program.

7.- Secondary market bid/offer spread

We the increase in volume, the spread has narrowed showing a more efficient market (see Figure 1-4).

2.4 The Model

Each country will present a unique set of characteristics that explain fluctuations in the market price. Individual regressions could have been run for each country, but the lack of enough timely data would have limited the number of explanatory variables to be included in the

regression.[40] As we know, the larger the number of unobserved variables, the lower the efficiency of the econometric estimators.

We can solve this problem by combining time series and cross-sectional data. One of the various ways of doing this, is letting a varying intercept term to capture differences in behavior over countries (country dummies) while the slope coefficients are assumed to be constant. The model can be written as:

$$y_{it} = \beta_1 + \mu_i + \sum_{k=2}^{k} \beta_k x_{kit} + e_{it}$$

Where $\beta_{1i} = \beta_1 + \mu_i$ is the intercept for the country ith, β_1 is the mean intercept, and μ_i represents the difference from this mean for the ith country.

Hypotheses about coefficients will be tested using the usual least squares procedure.

The R squared is the best known indicator of the success of a least squares fit. In this case, 99.6% of the change in the *Price of Debt* is explained by the changes in the explanatory variables. There are other indicators of the success of a least squares fit that we must look at: the t-ratios of the coefficients and the standard error of the regression.

The standard error of the regression indicates how close the fitted values have been to the actual values in the past. It is desirable to have a standard error as small as possible. The standard error of this

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[40] I could have normalized the equation to make the magnitude of coefficients comparable among countries.

regression is 3.982. This means that in 67% of the historical observations, the estimate is within 3.982 (+ or -) of the actual value. The t-ratio shows the significance of each explanatory variable in predicting the dependent variable. Any ratio greater than +2.0 or less than -2.0 is acceptable. It is desirable to have a t-ratio as large as possible (in absolute value) .

Dependent variable is: **Price of Debt**
R^2 = 99.7% R^2(adjusted) = 99.6%
s = 3.982 with 72 - 17 = 55 degrees of freedom

Source	**Sum of Squares**	**df**	**Mean Square**	**F-ratio**
Regression	256615	17	15095	952
Residual	871.976	55	15.8541	

Variable	**Coefficient**	**t-ratio**
Argentina	-60.5856	-0.995
Brazil	-54.1019	-0.870
Chile	-51.7953	-0.870
Mexico	-58.0035	-0.961
Venezuela	-60.0499	-1.00
Philippines	-38.9932	-0.673
Libor 6-months (t-1)	-2.40236	-2.85
Investment/GNP (HIC)	8.99803	2.28
Provision	-9.09930	-5.54
GNP per capita	0.011709	1.28
Net Debt/Exports	-3.46686	-2.90
(Reserves-Imports)/Debt	17.4177	0.637
Inflation rate (CPI)	-9.61928	-2.21
Spread Exchange rate	-0.612551	-0.172
Real-effective exchange	0.017000	0.190
Arrears	-8.02790	-3.05
Rescheduled/Debt	-1.28081	-0.313

Country dummies

All country dummies have unacceptable t-ratios. Now we test the hypotheses $ß_{11} = ß_{12} = ... = ß_{1N} = ß_1$, which is equivalent to: *Argentina = Brazil = Chile = Mexico = Venezuela = Philippines = Constant*. This hypothesis will be tested using the conventional F test that compares the restricted and unrestricted residual sums of squares.[41] A joint test such as this one is preferable to individual t-tests on the coefficients of each dummy variable.

$$\{ (e'e^c - e'e^u) / (N-1) \} \times \{ (N-K) / e'e^u \} = 3.5294$$

In a chi square distribution with 5 degrees of freedom, the area to the right of 9.236 is 0.10. The fact that 3.5294 is less than 9.236 implies that differences among countries are not significant.

If we drop the country dummies and run the regression with a constant, the R squared decreases to 90.2%, and the standard error increases to 4.381. The coefficient for the constant is -52.7314 and its t-ratio is -1.09. This means that the country dummies are capturing part of the differences among the countries, but do not have enough explanatory power.

Variables with significant t-ratios

The *Libor 6-months* variable was lagged one period trying to simulate the way in which interests are calculated when due. As it was expected this variable affects the price of the loans negatively.

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[41] The large number of observations allows to use the Chi-Square distribution.

Provision is probably the most important explanatory variable in this regression. It has the largest t-ratio (in absolute value) and the largest coefficient of all the variables with significant t-ratios.

The fact that these two variables are so important explains why the country dummies are not significantly different. The price of the debt was strongly influenced by the banks' decision to sell, and by the general level of interest rates. Both factors affected all countries in a very similar way.

Another important variable is *Arrears*. This variable has both cross-sectional and time series explanatory power. It gathers information on expectations.

Inflation is also very important across sections and along time. It seems to be specially significant for Argentina, Brazil, and Venezuela.

As expected, *Net Debt / Exports* was also a very strong variable.

Investment / GNP (HICs) ended up being very explicative, although in this case it is hard to understand the direction of the causality.

Variables with insignificant t-ratios

If we drop the variables with insignificant t-ratios (*Rescheduled / Debt*, *Real-effective exchange*, *Spread Exchange rate*, *(Reserves-Imports) / Debt*, and *GNP per capita*) the R squared only decreases to 99.6%. Now, if we remove the country dummies as well, the new R squared is 87.8%.

These variables does not seem to be contributing much to the explanation of movements in price and differences among countries. This is probably a result of high correlation between the independent variables. This pitfall is called collinearity and can be recognized when the t-ratios of two important variables are low. The collinearity in our

equation can be better understood by analyzing the correlation matrix presented in Appendix 5.

Variables tested but not included in the regression

Collinearity can even cause the coefficients of explanatory variables to have the opposite sign from that which would logically be expected. Some of the variables that were proposed in the previous section were excluded from the regression because they were highly correlated with other variables.

The *IMF* variable was not significative because it interfered with other explanatory variables, *Arrears* and *Spread Exchange rate*.

The *Debt-for-equity* program variable did not respond positively as it was expected. It was correlated with *Inflation* and *Provision*. Previous models that tested this variable found a positive relationship, but we have to consider that these models did not cover the year 1988.[42] During this year the economic situation of countries holding debt conversion programs deteriorated significantly, causing a drop in the price of their debt. Furthermore, banks may compete aggressively for the small conversion quotas allowed in these programs.

These institutional arrangements were not very important in explaining the behavior of loan prices, mainly because they are very difficult to measure accurately.

In theory, the effect that other variables have over the *Price of Debt* should not interfere with any individual variable. However, if some variables pass unobserved, their explanatory power may interfere with

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42 See Purcell and Orlansky (June 1988).

the observed variables, affecting the sign of coefficients and the size of the t-ratios. This is indeed our case.

Other variables were tested but did not have any explanatory power. *Commodity prices* were tested using country dummies. Their t-ratios were not significant. The important drop in the *Price of Oil* occurred in the first quarter of 1986, and therefore, it is marginally being taken into account. The t-ratios were not significant for Mexico or Venezuela. The coefficients of the *Food Price Index* for those countries that were supposed to be important, had the wrong sign. The *Metals Price Index* coefficient for Chile was positive, but it was not significant.

Both, the *Industrial Countries' Growth* and the *World Trade Growth* resulted with the opposite sign than what was expected.

2.5 Other Models

2.5.1 Jeffrey Sachs and Harry Huizinga[43]

They run the following regression (on a cross-country basis):

PRICE = discount on the LDC debt.
D/GNP = Debt - GNP ratio.
GNPGROWTH = rate of real GNP growth between 1980 and 1985.
SUSP = dummy that equals 1 if the country suspended interest payments before 1987, and 2 if the country suspended interest payments before 1987 and is still in suspension.
ATRR = dummy that indicates whether the U.S. bank regulators have mandated an allocated reserve.

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[43] Kyle Steven C. and Sachs Jeffrey D., Developing Country Debt and the Market Value of Large Commercial Banks, NBER Working Paper #1470, September 1984.

$R^2 = 0.84$
28 observations
Dependent variable = PRICE

Variable	Coefficient	t-ratio
CONSTANT	77.2	16.3
ATRR	-9.6	-1.2
SUSP	-17.2	-6.3
D/GNP	-0.15	-2.7
GNPGROWTH	2.2	2.2

2.5.2 Salomon Brothers[44]

The objective of this model is to identify trading opportunities, not to provide absolute measures of value. To increase the power of the model, 95% confidence intervals were defined around the model's predicted price. The panel data technique was used.

NDX = net debt-to-exports ratio. This variable is the ratio of a country's gross external debt minus its international reserves excluding gold to its total annual exports of goods and services.
PCI = per capita income
RP = rescheduling principal. It is a dummy that takes the value zero if the country has rescheduled any loans during the previous five years or if it had any arrears on interest payments. A value of one indicates full servicing of commercial bank debt over the previous five years.
SI = servicing interest. It is a dummy variable that applies only to those countries that have rescheduled during the previous five years. The variable will take the value one if interest payments are up to date, one half if arrears are evident, and zero if no interest has been paid for the previous three months or a moratorium was announced.
DE = debt-for-equity program. A value of one indicates the presence of an active and significant program, and a value of zero indicates its absence.
Level of loan loss provisions = The model was reestimated for the period beginning in the third quarter of 1987.

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[44] Purcell, John F. H. and Orlanski, Diego J., Developing Country Loans: A Valuation Model for Secondary Market Trading, Salomon Brothers Inc., International Loan Trading Analysis, June 17, 1988.

$R^2 = 0.98$
Dependent variable = LN. PRICE (average bid/offer price)

Variable	Coefficient	t-ratio
IQ86 - IIQ87		
CONSTANT	2.96	3.88
LN. NDX	-0.18	-2.33
LN. PCI	0.24	3.45
RP	0.77	2.58
SI	0.23	2.79
DE	0.18	1.87
IIIQ87 - IQ88		
CONSTANT	3.57	4.46
LN. NDX	-0.34	-4.91
LN. PCI	0.23	2.93
RP	0.78	3.59
SI	0.47	4.52
DE	0.16	1.74

2.5.3 Leroy O. Laney[45]

Laney approaches the problem from a different perspective. He uses principal components analysis to compress the economic variables into a single economic index, and the political variables into a structural index.

The variables he includes in his economic index are: Acceleration of inflation, Variation of inflation, Debt/exports ratio, Change in debt/exports ratio, Debt/GNP ratio, Change in debt/GNP ratio, Real GNP per capita, Change in real GNP per capita, Country risk index, and Reserves/imports ratio.
The variables he includes in the structural index are: Country size, Food production per capita, Literacy rate, Televisions per capita, Telephones per capita, Physical quality-of-life index, Number of debt renegotiations (1975-85), Size of cabinet, U.S. economic aid, and Index of homogeneity.

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[45] Laney, Leroy, The Secondary Market in the Developing Country Debt: Some Observations and Policy Implications, Federal Reserve Bank of Dallas Economic Review, July 1987

$R^2 = 0.62$
28 observations
Dependent variable = Market loan price

Variable	Coefficient	t-ratio
CONSTANT	56.32	20.33
ECONOMIC INDEX	-10.53	-6.11
STRUCTURAL INDEX	-1.06	-0.74

Conclusions

In this thesis several aspects of the secondary market for Less Developed Countries' debt have been investigated. The empirical analysis looked at the price formation process for the most actively traded countries. The panel data technique has been used to overcome statistical limitations. Still, the effects of unobserved variables limited the derivation of stronger results with regard to some key variables.

The main findings of this analysis can be summarized as follows. First, the influence that market characteristics and institutional arrangements have over the price of the loans wiped out differences among the debtor countries that may arise due to their different credit qualities. The negotiation process has homogenized the market's perception of credit quality (ability and willingness to pay) for all these countries.

Second, it was found that the price of a country's debt is positively related to the growth of an economy and inversely related to the relative amount of debt. A very strong negative relationship was found with the level of bank's reserves, the Libo rate, the rate of inflation, and the degree to which a country services its debt. The relationship with the Gross National Product per capita, the real-effective exchange rate, the exchange rate differential, the ratio of debt rescheduled to total debt, and the ratio of international reserves minus imports to total debt was statistically insignificant.

Third, collinearity and autocorrelation prevented us from including some key variables in the regression, namely, the existence of an IMF program, the existence of a Debt-for-equity program, the Industrial countries' growth rate, and commodity prices (Oil, Food, and Metals).

Fourth, other variables, like political situation, were left out because it was highly correlated with the country dummies.

We conclude with an outline of possible extensions. It would be interesting to expand the size of the sample in order to improve the efficiency of the econometric estimators. This could be done by including three other countries, namely Nigeria, Polonia, and Yugoslavia, and by expanding the period of time to include the year 1985.

Appendices

APPENDIX 1
INDICATIVE PRICES FOR LDCs DEBT
(Average of bid/offer price)

Date	Argentina	Brazil	Chile	Mexico	Venezuela	Phlilippines	Average
Jan-86	65.00	75.75	68.50	69.50	80.00	59.50	69.71
Feb-86	65.00	75.75	68.25	64.25	79.50	59.50	68.71
Mar-86	65.00	75.50	68.00	61.50	79.50	59.50	68.17
Apr-86	64.75	76.00	67.50	59.25	77.00	59.50	67.33
May-86	64.50	76.00	67.50	61.00	77.00	61.00	67.83
Jun-86	66.50	74.75	68.00	59.00	77.00	64.50	68.29
Jul-86	67.50	74.75	67.50	58.00	76.00	65.50	68.21
Aug-86	67.00	75.50	67.50	57.50	75.00	66.00	68.08
Sep-86	67.00	75.50	67.50	57.00	75.50	66.50	68.17
Oct-86	66.25	75.50	67.50	56.75	74.50	72.00	68.75
Nov-86	66.00	75.50	68.00	56.50	74.50	73.50	69.00
Dec-86	66.00	74.00	67.75	56.50	74.50	73.00	68.63
Jan-87	65.75	72.75	68.00	57.00	74.50	73.00	68.50
Feb-87	65.75	71.50	68.25	57.50	75.50	71.25	68.29
Mar-87	60.50	64.00	70.00	59.38	73.75	71.00	66.44
Apr-87	60.25	64.00	70.00	59.13	73.75	71.00	66.35
May-87	60.00	63.50	71.25	58.63	73.00	71.25	66.27
Jun-87	51.50	61.50	69.75	57.13	71.50	70.00	63.56
Jul-87	47.75	58.00	68.75	54.50	69.50	69.00	61.25
Aug-87	46.75	47.00	65.75	51.00	65.00	66.75	57.04
Sep-87	37.50	39.50	57.00	47.63	54.50	59.75	49.31
Oct-87	36.00	40.00	51.50	50.00	50.75	52.00	46.71
Nov-87	37.00	48.75	54.50	51.50	53.00	51.50	49.38
Dec-87	36.88	47.00	60.50	53.00	60.13	50.38	51.31
Jan-88	32.00	46.50	61.75	50.50	54.75	50.50	49.33
Feb-88	28.75	46.38	59.25	48.00	53.88	51.00	47.88
Mar-88	28.50	47.75	58.00	48.88	53.88	51.00	48.00
Apr-88	29.19	51.50	59.50	51.94	54.88	51.50	49.75
May-88	29.00	54.88	61.88	53.88	57.13	54.25	51.83
Jun-88	24.50	50.63	61.00	50.38	54.88	54.25	49.27
Jul-88	26.13	52.13	60.88	50.63	55.63	54.25	49.94
Aug-88	24.50	49.13	60.88	48.13	53.13	53.25	48.17
Sep-88	22.13	47.38	60.13	48.38	49.50	52.50	46.67
Oct-88	21.38	44.38	58.00	46.38	44.50	51.50	44.35
Nov-88	18.00	39.25	53.75	42.88	40.38	50.00	40.71
Dec-88	21.75	40.63	58.88	42.38	39.13	49.00	41.96
Jan-89	19.88	34.38	60.38	38.63	37.13	46.63	39.50
Feb-89	17.63	26.88	55.63	33.38	27.63	36.50	32.94
Mar-89	16.88	29.13	56.00	39.25	33.75	37.50	35.42

Source: Salomon Brothers Inc., High-Yield Department, International Loan Trading.

APPENDIX 2
INDICATIVE PRICES FOR LDCs DEBT: BID/OFFER SPREAD

Date	Argentina	Brazil	Chile	Mexico	Venezuela	Phlilippines	Average
Jan-86	2.00	3.50	3.00	3.00	3.00	5.00	3.25
Feb-86	2.00	3.50	2.50	2.50	3.00	5.00	3.08
Mar-86	2.00	3.00	2.00	3.00	3.00	5.00	3.00
Apr-86	0.50	2.00	3.00	3.50	2.00	5.00	2.67
May-86	1.00	2.00	3.00	2.00	2.00	4.00	2.33
Jun-86	1.00	1.50	2.00	2.00	2.00	1.00	1.58
Jul-86	1.00	1.50	3.00	2.00	2.00	1.00	1.75
Aug-86	1.00	1.00	3.00	2.00	2.00	2.00	1.83
Sep-86	1.00	1.00	3.00	2.00	1.00	2.00	1.67
Oct-86	0.50	1.00	3.00	1.50	1.00	2.00	1.50
Nov-86	1.00	1.00	2.00	1.00	1.00	3.00	1.50
Dec-86	1.00	2.00	1.50	1.00	1.00	2.00	1.42
Jan-87	1.50	2.50	1.00	1.00	1.00	2.00	1.50
Feb-87	1.50	5.00	0.50	1.00	1.00	1.50	1.75
Mar-87	2.00	2.00	1.00	0.75	1.50	2.00	1.54
Apr-87	1.50	2.00	1.00	0.75	1.50	2.00	1.46
May-87	1.00	1.00	1.50	0.75	1.00	1.50	1.13
Jun-87	2.00	1.00	1.50	0.75	1.00	1.00	1.21
Jul-87	1.50	2.00	1.50	1.00	1.00	2.00	1.50
Aug-87	2.50	2.00	1.50	1.00	2.00	1.50	1.75
Sep-87	1.00	1.00	2.00	0.75	3.00	1.50	1.54
Oct-87	2.00	1.00	1.00	1.00	1.50	2.00	1.42
Nov-87	1.00	1.50	1.00	1.00	1.00	1.00	1.08
Dec-87	1.25	1.00	1.00	1.00	0.75	0.75	0.96
Jan-88	2.00	1.00	1.50	1.00	1.50	1.00	1.33
Feb-88	1.50	1.25	1.50	1.00	1.25	1.00	1.25
Mar-88	1.00	1.50	2.00	0.75	1.25	1.00	1.25
Apr-88	0.88	1.00	1.00	1.12	1.25	1.00	1.04
May-88	1.00	0.75	1.25	0.75	0.75	1.50	1.00
Jun-88	1.00	0.75	1.00	0.75	1.25	1.50	1.04
Jul-88	0.75	0.75	0.75	0.75	0.75	1.50	0.88
Aug-88	1.00	0.75	0.75	0.75	0.75	1.50	0.92
Sep-88	0.75	0.75	0.75	0.75	1.00	1.00	0.83
Oct-88	0.75	0.75	1.00	0.75	1.00	1.00	0.88
Nov-88	1.00	1.00	1.00	0.75	0.75	1.00	0.92
Dec-88	0.50	0.75	0.75	0.75	0.75	1.00	0.75
Jan-89	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Feb-89	0.75	1.25	0.75	0.75	0.75	1.00	0.88
Mar-89	0.75	0.75	1.00	1.00	1.00	1.00	0.92

Source: Salomon Brothers Inc., High-Yield Department, International Loan Trading.

APPENDIX 3
MODEL SPECIFIC VARIABLES

		(1) 6-months Libor	(2) Average Prime	(3) Price of Oil	(4) Food Index	(5) Metals Index	(6) Level of Loan Loss Provision	(7) Growth Industrial Countries	(8) Growth World Trade	(9) Investment In Latin America as % GNP
85	III	8.33%	9.50%	$26.33	93.4	98.7	0	102.3	103.0	15.18%
	IV	8.19%	9.50%	$25.81	103.4	94.2	0	103.1	104.0	15.21%
86	I	7.91%	9.37%	$25.20	117.6	98.1	0	103.8	104.7	15.15%
	II	7.11%	8.61%	$14.15	111.6	99.7	0	104.5	105.3	15.10%
	III	6.27%	7.85%	$12.88	100.8	98.4	0	105.2	106.0	15.04%
	IV	6.09%	7.50%	$14.09	97.7	98.4	0	105.9	106.7	14.99%
87	I	6.36%	7.50%	$17.12	91.0	104.9	0	106.7	107.8	14.95%
	II	7.36%	8.05%	$17.87	93.3	117.4	0	107.6	109.0	14.92%
	III	7.48%	8.40%	$17.66	88.9	135.8	1	108.5	110.1	14.88%
	IV	8.01%	8.90%	$17.33	99.0	156.3	1	109.4	111.3	14.85%
88	I	7.12%	8.60%	$15.08	104.6	181.4	1	110.4	113.3	14.67%
	II	7.68%	8.80%	$16.06	113.0	228.1	1	111.5	115.4	14.49%
	III	8.67%	9.70%	$14.74	118.6	202.2	1	112.6	117.5	14.32%
	IV	9.04%	10.00%	$14.51	116.5	217.2	1	113.6	119.6	14.14%

(1) Six months London Interbank Offer rate on US dollar deposit, period average - (60lde) IFS
(2) Prime Rate charged by banks on short-term business loans, period averages, Federal Reserve Bulletin
(3) Crude Oil Arab leve, $ per barrel, period average, Rotterdam, Platt's Oilgram Price Service
(4) Index 1985 = 100, The Economist
(5) Index 1985 = 100, The Economist
(6) Money Center Banks increase provisions in the second quarter of 1987
(7) December 31, 1984 = 100, World Debt Tables
(8) December 31, 1984 = 100, volume, World Debt Tables
(9) Investment as a percentage of GNP for Highly Indebted Countries, World Debt Tables

APPENDIX 4
COUNTRY DATA

	Date	(1) GNP	(2) Population	(3) GNP/capita	(4) Reserves	(5) Exports f.o.b Quarterly	(6) Annual	(7) Imports f.o.b	(8) Total Debt	(9) Interest paid
	86 I	$71,918	31.0	$2,318	$2,702	$1,513	$8,106	$844	$49,422	$1,030
A	II	$75,922	31.1	$2,438	$4,199	$1,968	$7,504	$1,060	$49,519	$995
R	III	$79,782	31.3	$2,552	$3,775	$1,897	$7,091	$1,274	$49,617	$894
G	IV	$74,278	31.4	$2,367	$2,718	$1,475	$6,853	$1,146	$49,715	$788
E	87 I	$77,602	31.5	$2,464	$2,594	$1,441	$6,781	$1,098	$51,402	$842
N	II	$77,602	31.6	$2,454	$1,491	$1,741	$6,554	$1,282	$53,146	$880
T	III	$76,317	31.7	$2,405	$1,031	$1,618	$6,275	$1,512	$54,949	$1,018
I	IV	$76,090	31.9	$2,388	$1,617	$1,560	$6,360	$1,488	$56,813	$1,035
N	88 I	$79,151	32.0	$2,475	$1,468	$1,615	$6,534	$1,083	$57,108	$909
A	II	$76,385	32.1	$2,380	$1,858	$2,329	$7,122	$1,349	$57,403	$808
	III	$78,076	32.2	$2,423	$3,040	$2,521	$8,025	$1,406	$57,701	$871
	IV	$78,383	32.3	$2,424	$2,500	$2,035	$8,500	$1,359	$58,000	$984
	86 I	$304,092	134.6	$2,259	$8,972	$5,818	$26,460	$3,353	$108,024	$2,083
	II	$306,692	135.3	$2,267	$9,240	$6,464	$26,367	$2,760	$109,586	$2,012
	III	$306,518	135.9	$2,255	$7,688	$6,165	$25,773	$3,661	$111,171	$1,809
B	IV	$305,795	136.6	$2,238	$5,803	$3,932	$22,379	$4,270	$112,778	$1,595
R	87 I	$323,683	137.3	$2,357	$3,923	$4,152	$20,713	$3,565	$115,468	$1,302
A	II	$324,505	138.2	$2,348	$4,503	$6,504	$20,753	$3,611	$118,223	$1,360
Z	III	$309,410	139.1	$2,224	$6,096	$8,370	$22,958	$3,987	$121,043	$1,573
I	IV	$300,970	140.1	$2,149	$6,299	$7,199	$26,225	$3,889	$123,931	$1,599
L	88 I	$306,066	141.0	$2,171	$5,983	$6,694	$28,768	$3,516	$121,130	$2,067
	II	$312,857	141.7	$2,208	$6,250	$8,821	$31,077	$3,346	$118,392	$1,838
	III	$322,400	142.4	$2,264	$9,330	$9,746	$32,432	$3,776	$115,716	$1,982
	IV	$322,279	143.1	$2,252	$9,970	$9,369	$33,800	$3,988	$113,100	$2,238
	86 I	$16,917	12.3	$1,372	$2,235	$967	$3,839	$547	$20,351	$391
	II	$17,370	12.4	$1,403	$2,330	$1,156	$3,987	$613	$20,313	$378
	III	$16,965	12.4	$1,364	$2,130	$1,044	$4,151	$710	$20,274	$339
C	IV	$17,160	12.5	$1,374	$2,351	$1,056	$4,223	$732	$20,236	$299
H	87 I	$18,565	12.5	$1,480	$2,206	$1,122	$4,378	$768	$20,482	$317
I	II	$17,847	12.6	$1,417	$2,440	$1,274	$4,496	$809	$20,731	$331
L	III	$18,001	12.6	$1,424	$2,241	$1,297	$4,749	$939	$20,984	$383
E	IV	$17,967	12.7	$1,415	$2,504	$1,408	$5,101	$871	$21,239	$389
	88 I	$19,316	12.8	$1,515	$2,504	$1,745	$5,724	$949	$20,686	$445
	II	$19,389	12.8	$1,515	$2,669	$1,744	$6,194	$969	$20,146	$396
	III	$19,700	12.8	$1,534	$2,668	$1,636	$6,533	$1,128	$19,621	$427
	IV	$19,663	12.9	$1,525	$3,161	$1,875	$7,000	$1,754	$19,110	$482

			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
							Exports f.o.b		Imports	Total	Interest
			GNP	Population	GNP/capita	Reserves	Quarterly	Annual	f.o.b	Debt	paid
	86	I	$139,677	79.6	$1,756	$5,003	$4,009	$19,972	$2,967	$97,903	$2,149
		II	$141,033	80.0	$1,764	$3,461	$3,768	$18,826	$3,063	$98,942	$2,076
M		III	$134,253	80.4	$1,671	$3,334	$3,666	$17,151	$2,693	$99,993	$1,866
E		IV	$134,253	80.8	$1,662	$5,670	$4,588	$16,031	$2,709	$101,054	$1,646
X	87	I	$132,913	81.2	$1,638	$7,740	$4,827	$16,849	$2,512	$102,719	$1,582
I		II	$139,558	81.7	$1,709	$12,552	$5,360	$18,441	$2,915	$104,412	$1,653
C		III	$140,887	82.2	$1,715	$13,314	$5,211	$19,986	$3,308	$106,133	$1,912
O		IV	$143,546	82.7	$1,737	$12,464	$5,257	$20,655	$3,487	$107,882	$1,944
	88	I	$137,884	83.2	$1,658	$14,524	$5,274	$21,102	$3,738	$106,640	$2,128
		II	$141,960	83.6	$1,699	$12,855	$5,439	$21,181	$4,536	$105,413	$1,892
		III	$139,243	84.0	$1,658	$8,591	$5,002	$20,972	$5,109	$104,199	$2,041
		IV	$140,601	84.4	$1,666	$5,280	$3,885	$19,600	$5,217	$103,000	$2,304
	86	I	$35,694	17.8	$2,006	$9,961	$3,402	$12,576	$1,938	$34,697	$622
V		II	$36,264	17.9	$2,025	$9,164	$2,518	$12,360	$2,332	$34,701	$600
E		III	$40,325	18.0	$2,237	$7,933	$2,535	$11,678	$2,295	$34,705	$540
N		IV	$37,760	18.1	$2,081	$6,437	$1,924	$10,380	$1,865	$34,709	$476
E	87	I	$36,579	18.3	$2,002	$6,123	$1,368	$8,346	$1,205	$35,153	$562
Z		II	$38,489	18.4	$2,093	$5,828	$1,499	$7,326	$1,745	$35,603	$587
U		III	$40,546	18.5	$2,191	$5,998	$2,901	$7,692	$2,305	$36,058	$679
E		IV	$38,930	18.6	$2,090	$5,963	$2,683	$8,452	$2,663	$36,519	$690
L	88	I	$38,284	18.8	$2,042	$5,166	$2,361	$9,444	$2,391	$36,255	$714
A		II	$38,575	18.9	$2,044	$5,020	$2,592	$10,537	$2,757	$35,994	$635
		III	$40,682	19.0	$2,142	$3,934	$2,593	$10,229	$2,951	$35,734	$685
		IV	$37,776	19.1	$1,976	$3,092	$2,454	$10,000	$1,500	$35,476	$773
	86	I	$32,170	56.0	$574	$744	$1,103	$4,594	$1,259	$26,832	$372
P		II	$33,174	56.3	$589	$1,055	$1,225	$4,633	$1,260	$27,489	$359
H		III	$30,481	56.7	$538	$1,098	$1,262	$4,718	$1,239	$28,163	$323
I		IV	$35,187	57.0	$617	$1,728	$1,252	$4,842	$1,286	$28,853	$285
L	87	I	$34,350	57.4	$599	$1,668	$1,218	$4,957	$1,437	$29,126	$334
I		II	$34,264	57.6	$595	$1,445	$1,373	$5,105	$1,595	$29,402	$349
P		III	$31,913	57.8	$552	$1,101	$1,509	$5,352	$1,881	$29,681	$404
P		IV	$37,953	58.0	$654	$968	$1,620	$5,720	$1,824	$29,962	$410
I	88	I	$37,803	58.2	$649	$737	$1,543	$6,045	$1,774	$30,096	$448
N		II	$37,725	58.4	$645	$617	$1,706	$6,378	$2,010	$30,230	$398
E		III	$35,602	58.7	$607	$433	$1,848	$6,717	$2,266	$30,365	$429
S		IV	$37,042	58.9	$629	$1,003	$1,603	$6,700	$1,750	$30,500	$485

	Date	(10) Inflation CPI	(11) Exchange rate Official	(12) Exchange rate Parallel	(13) Spread Exchange rate	(14) Real-effective exchange rate	(15) Rescheduled / Debt	(16) Arrears	(17) Debt-for-equity	(18) Democracy Dictatorship
	86 I	8.89%	0.8005	0.8913	11.34%	62.00	0.2873	0	0	0
A	II	13.13%	0.8490	0.9057	6.68%	61.30	0.2868	0	0	0
R	III	20.77%	0.9722	1.0770	10.78%	58.70	0.2862	0	0	0
G	IV	19.99%	1.1505	1.3743	19.45%	58.70	0.2856	0	0	0
E	87 I	20.81%	1.4049	1.7700	25.99%	53.20	0.2763	0	0	0
N	II	17.28%	1.6100	2.0620	28.07%	53.50	0.8806	0	0	0
T	III	33.28%	2.1463	2.9243	36.25%	53.50	0.8517	0.5	0	0
I	IV	44.51%	3.4160	4.1837	22.47%	49.10	0.8238	1	1	0
N	88 I	29.32%	4.3788	5.8800	34.28%	51.60	0.8195	1	1	0
A	II	55.18%	6.7977	8.4433	24.21%	56.90	0.8153	1	1	0
	III	80.25%	11.1815	13.4530	20.31%	66.40	0.8111	1	1	0
	IV	33.74%	12.6524	15.2900	20.85%	70.70	0.8069	1	1	0
	86 I	50.98%	12.7300	17.6000	38.26%	75.20	0.3710	0	0	0
	II	8.08%	13.8400	20.0000	44.51%	73.00	0.3657	0	0	0
	III	2.18%	13.8400	23.3300	68.57%	72.40	0.6395	0	0	0
B	IV	5.97%	14.2200	27.8000	95.50%	75.90	0.6304	0	0	0
R	87 I	38.51%	18.2300	29.6000	62.37%	71.10	0.6157	0	0	0
A	II	76.14%	31.3100	45.4000	45.00%	75.30	0.6014	1	0	0
Z	III	45.45%	47.3100	59.7000	26.19%	70.90	0.5873	1	0	0
I	IV	37.96%	60.0600	80.7000	34.37%	74.70	0.5737	1	1	0
L	88 I	65.97%	91.8800	122.0000	32.78%	76.80	0.5869	1	1	0
	II	69.25%	151.5400	216.0000	42.54%	80.70	0.6005	1	1	0
	III	78.59%	269.8200	410.0000	51.95%	83.90	1.1415	1	1	0
	IV	101.73%	536.2900	877.8000	63.68%	77.40	1.1679	1	0	0
	86 I	5.24%	187.0100	201.7000	7.86%	67.10	0.7093	0	1	1
	II	3.63%	188.6400	199.0000	5.49%	70.20	0.7107	0	1	1
	III	3.08%	194.5300	203.6000	4.66%	67.50	0.7120	0	1	1
C	IV	4.25%	201.8800	217.0000	7.49%	68.00	0.7134	0	1	1
H	87 I	5.23%	212.5400	216.0000	1.63%	66.50	0.7048	0	1	1
I	II	5.40%	222.1600	227.0000	2.18%	65.50	0.6963	0	1	1
L	III	4.30%	225.3500	233.9000	3.79%	65.30	1.0552	0	1	1
E	IV	5.64%	238.1100	245.9000	3.27%	61.40	1.0425	0	1	1
	88 I	2.47%	244.3300	267.1000	9.32%	59.70	1.0704	0	1	1
	II	2.70%	250.7900	278.6000	11.09%	60.30	1.0990	0	1	1
	III	1.55%	246.3800	291.3000	18.23%	59.90	1.1284	0	1	1
	IV	4.37%	246.0700	291.1000	18.30%	59.00	1.1586	0	1	1

			(10) Inflation CPI	(11) Exchange rate Official	(12) Parallel	(13) Spread Exchange rate	(14) Real-effective exchange rate	(15) Rescheduled / Debt	(16) Arrears	(17) Debt-for-equity	(18) Democracy Dictatorship
	86	I	20.60%	423.6000	463.4000	9.40%	68.30	0.7131	0	0	0
		II	16.49%	522.2000	554.1000	6.11%	66.60	0.7056	0	1	0
M		III	19.63%	665.7000	686.2000	3.08%	60.60	0.6982	0	1	0
E		IV	20.84%	835.6000	846.7000	1.33%	59.80	1.2084	0	1	0
X	87	I	24.35%	1025.7000	1019.2000	-0.63%	61.90	1.1888	0	1	0
I		II	24.82%	1241.7000	1232.4000	-0.75%	65.00	1.1696	0	1	0
C		III	24.89%	1460.8000	1453.4000	-0.51%	71.50	1.1506	0	1	0
O		IV	28.14%	1784.6000	1917.5000	7.45%	67.30	1.1319	0	0	0
	88	I	38.89%	2249.4000	2265.7000	0.72%	80.10	1.1451	0	0	0
		II	11.46%	2281.0000	2298.3000	0.76%	80.80	1.1585	0	0	0
		III	4.54%	2281.0000	2300.0000	0.83%	79.30	1.1720	0	0	0
		IV	3.08%	2281.0000	2300.0000	0.83%	77.60	1.1856	0	0	0
	86	I	3.65%	7.5000	17.7000	136.00%	89.00	0.5775	0	0	0
V		II	1.38%	7.5000	19.1000	154.67%	90.20	0.5774	0	0	0
E		III	3.31%	7.5000	19.5000	160.00%	89.90	0.5774	0	0	0
N		IV	4.15%	9.8330	23.2000	135.94%	47.40	0.5773	0	0	0
E	87	I	5.60%	14.5000	22.9000	57.93%	56.80	0.5700	0	0	0
Z		II	9.89%	14.5000	25.5000	75.86%	61.70	0.5628	0	1	0
U		III	10.78%	14.5000	30.7000	111.72%	64.50	0.5557	0	1	0
E		IV	6.95%	14.5000	31.0000	113.79%	63.20	0.5487	0	1	0
L	88	I	2.28%	14.5000	30.1000	107.59%	62.60	0.5817	0	1	0
A		II	3.95%	14.5000	30.8000	112.41%	64.00	0.5859	0	1	0
		III	11.36%	14.5000	36.2000	149.66%	66.00	0.5901	0.5	1	0
		IV	11.69%	14.5000	37.1000	155.86%	64.30	0.5944	1	1	0
	86	I	1.60%	20.6000	20.6000	0.00%	91.40	0.2193	0	0	1
P		II	-2.08%	20.5800	20.5800	0.00%	87.40	0.2141	0	0	0
H		III	-0.67%	20.4480	20.4480	0.00%	86.40	0.2090	0	1	0
I		IV	0.83%	20.5300	20.5300	0.00%	90.00	0.2040	0	1	0
L	87	I	1.37%	20.5500	20.5500	0.00%	84.20	0.2021	0	1	0
I		II	1.16%	20.4560	20.4560	0.00%	86.10	0.2002	0	1	0
P		III	2.79%	20.6000	20.6000	0.00%	87.20	0.1983	0	1	0
P		IV	1.41%	20.8000	20.8000	0.00%	86.20	0.1964	0	1	0
I	88	I	3.26%	21.0160	21.0160	0.00%	87.40	0.1955	0	1	0
N		II	1.53%	21.0620	21.0620	0.00%	89.90	0.6214	0	1	0
E		III	1.78%	21.3360	21.3360	0.00%	92.60	0.6186	0.5	1	0
S		IV	1.79%	21.3350	21.3350	0.00%	95.60	0.6159	1	1	0

	Date	(19) IMF Program	(20) Debt / GNP	(21) Debt / Exports Annual	(22) Reserves Imports	(23) Net Debt Exports Annual
	86 I	1	0.687	6.097	3.201	5.7636
A	II	0	0.652	6.599	3.961	6.0395
R	III	0	0.622	6.997	2.963	6.4648
G	IV	0	0.669	7.254	2.372	6.8579
E	87 I	0	0.662	7.580	2.362	7.1977
N	II	0	0.685	8.109	1.163	7.8814
T	III	1	0.720	8.757	0.682	8.5925
I	IV	1	0.747	8.933	1.087	8.6786
N	88 I	1	0.722	8.740	1.355	8.5154
A	II	1	0.752	8.060	1.377	7.7991
	III	1	0.739	7.190	2.162	6.8113
	IV	0	0.740	6.824	1.840	6.5294
	86 I	1	0.355	4.083	2.676	3.7435
	II	0	0.357	4.156	3.348	3.8057
	III	0	0.363	4.313	2.100	4.0152
B	IV	0	0.369	5.039	1.359	4.7802
R	87 I	0	0.357	5.575	1.100	5.3853
A	II	0	0.364	5.697	1.247	5.4797
Z	III	0	0.391	5.272	1.529	5.0069
I	IV	0	0.412	4.726	1.620	4.4855
L	88 I	0	0.396	4.211	1.702	4.0026
	II	0	0.378	3.810	1.868	3.6085
	III	0	0.359	3.568	2.471	3.2803
	IV	1	0.351	3.346	2.500	3.0512
	86 I	1	1.203	5.301	4.086	4.7190
	II	1	1.169	5.095	3.801	4.5104
	III	1	1.195	4.884	3.000	4.3711
C	IV	1	1.179	4.792	3.212	4.2351
H	87 I	1	1.103	4.678	2.872	4.1746
I	II	1	1.162	4.611	3.016	4.0684
L	III	1	1.166	4.419	2.387	3.9467
E	IV	1	1.182	4.164	2.875	3.6728
	88 I	1	1.071	3.614	2.639	3.1764
	II	1	1.039	3.253	2.754	2.8217
	III	1	0.996	3.003	2.365	2.5950
	IV	1	0.972	2.730	1.802	2.2784

			(19) IMF Program	(20) Debt / GNP	(21) Debt / Exports Annual	(22) Reserves Imports	(23) Net Debt Exports Annual
	86	I	0	0.701	4.902	1.686	4.6515
		II	0	0.702	5.256	1.130	5.0718
M		III	0	0.745	5.830	1.238	5.6357
E		IV	0	0.753	6.304	2.093	5.9500
X	87	I	1	0.773	6.096	3.081	5.6371
I		II	1	0.748	5.662	4.306	4.9813
C		III	1	0.753	5.310	4.025	4.6442
O		IV	1	0.752	5.223	3.574	4.6196
	88	I	1	0.773	5.054	3.886	4.3653
		II	0	0.743	4.977	2.834	4.3698
		III	0	0.748	4.969	1.682	4.5589
		IV	0	0.733	5.255	1.012	4.9857
	86	I	0	0.972	2.759	5.140	1.9669
V		II	0	0.957	2.808	3.930	2.0661
E		III	0	0.861	2.972	3.457	2.2925
N		IV	0	0.919	3.344	3.451	2.7237
E	87	I	0	0.961	4.212	5.081	3.4783
Z		II	0	0.925	4.860	3.340	4.0642
U		III	0	0.889	4.688	2.602	3.9079
E		IV	0	0.938	4.321	2.239	3.6152
L	88	I	0	0.947	3.839	2.161	3.2920
A		II	0	0.933	3.416	1.821	2.9395
		III	0	0.878	3.493	1.333	3.1088
		IV	0	0.939	3.548	2.061	3.2384
	86	I	1	0.834	5.841	0.591	5.6787
P		II	1	0.829	5.933	0.837	5.7057
H		III	0	0.924	5.969	0.886	5.7365
I		IV	1	0.820	5.959	1.344	5.6020
L	87	I	1	0.848	5.876	1.161	5.5393
I		II	1	0.858	5.760	0.906	5.4765
P		III	1	0.930	5.546	0.585	5.3400
P		IV	1	0.789	5.238	0.531	5.0689
I	88	I	1	0.796	4.979	0.415	4.8567
N		II	1	0.801	4.740	0.307	4.6430
E		III	1	0.853	4.521	0.191	4.4561
S		IV	0	0.823	4.552	0.573	4.4025

In millions of dollars unless otherwise indicated.

(1) Dollar GNPs for 1987 from the World Debt Tables, adjusted with annual real growth rates. Quarterly GNP growth rates are available for Argentina, Chile and Philippines. For Brazil and Mexico, an Industrial Production Index was used. For Venezuela, an Oil Production Index was used.
(2) In millions. International Financial Statistics and The Economist Intelligence Unit Country Reports. Quarterly figures were obtained using a linear estimation.
(3) = (1) / (2). In dollars.
(4) Total Reserves minus gold, International Financial Statistics.
(5) Exports f.o.b., International Financial Statistics.
(6) Last four quarters of Exports f.o.b. accumulated.
(7) Imports f.o.b., International Financial Statistics.
(8) Includes public and publicly guaranteed long-term debt, private non-guaranteed long-term debt, short-term debt, and the use of IMF credit. Linear approximation for quarterly data. World Debt Tables.
(9) Amount of interest paid by the country. Linear approximation for quarterly data.
(10) Quarterly rate of change of the Consumer Price Index. International Financial Statistics.
(11) In units of local currency per U.S. dollar, quarterly averages. International Financial Statistics.
(12) In units of local currency per U.S. dollar, quarterly averages. J.P. Morgan.
(13) = (12) / (11) - 1
(14) Real-effective exchange rate, 1980 - 82 average = 100. World Financial Markets, J.P. Morgan.
(15) Amount of debt rescheduled since 1978 as a percentage of total debt. World Debt Tables and IMF.
(16) Takes the value zero if the country is up to date with interest payments, one half if arrears are evident, and one if no interest have been paid for the previous three months or payment suspension was announced.
(17) Takes the value one if there is an active program and zero if there is no program.
(18) Takes the value zero if there is a democratic government and one if there is a dictatorship or military government.
(19) Takes the value one if the country is under a Stand-by or extended arrangement and zero otherwise.
(20) = (8) / (1)
(21) = (8) / (6)
(22) = (4) / (7)
(23) = [(8) - (4)] / (6)

APPENDIX 5
PEARSON PRODUCT-MOMENT CORRELATION

	a)	b)	c)	d)	e)	f)	g)	h)	i)	j)	k)	l)
a) Price of Debt	1.000											
b) Libor 6-m (t-1)	-0.411	1.000										
c) Investment/GNP	0.673	-0.402	1.000									
d) Provision	-0.734	0.473	-0.760	1.000								
e) GNP per capita	-0.178	-0.006	-0.008	0.004	1.000							
f) Debt-Res/Exports	-0.394	-0.204	0.166	-0.096	0.111	1.000						
g) (Res-Imp)/Debt	0.400	-0.034	0.216	-0.198	0.329	-0.584	1.000					
h) Spread Ex. rate	0.172	0.052	-0.041	0.003	0.470	-0.466	0.506	1.000				
i) Inflation (CPI)	-0.497	0.087	-0.254	0.244	0.523	0.215	-0.132	0.002	1.000			
j) Real Ex. rate	0.143	0.214	-0.075	0.024	-0.584	-0.268	-0.191	-0.067	-0.095	1.000		
k) Arrears	-0.693	0.287	-0.510	0.471	0.330	0.220	-0.298	0.105	0.715	0.010	1.000	
l) Rescheduled/Debt	-0.383	0.120	-0.442	0.394	0.216	-0.155	0.252	-0.120	0.253	-0.300	0.112	1.000

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