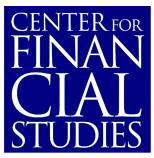

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Bank Loans Non-Linear Structure of Pricing: Empirical Evidence from Sovereign Debts

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Bank Loans Non-Linear Structure of Pricing: Empirical Evidence from Sovereign Debts

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Abstract:
The paper suggests an innovative contribution to the investigation of banking liabilities pricing contracted by sovereign agents. To address fundamental issues of banking, the study focuses on the determinants of the up-front fees (the up-front fee is a charge paid out at the signature of the loan arrangement). The investigation is based on a uniquely extensive sample of bank loans contracted or guaranteed by 58 less-developed countries sovereigns in the period from 1983 to 1997. The well detailed reports allow for the calculation of the equivalent yearly margin on the utilization period for all individual loan. The main findings suggest a significant impact of the renegotiation and agency costs on front-end borrowing payments. Unlike the sole interest spread, the all-in interest margin better takes account of these costs. The model estimates however suggest the non-linear pricing is hardly associated with an exogenous split-up intended by the borrower and his banker to cover up information. Instead the up-front payment is a liquidity transfer as described by Gorton and Kahn (2000) to compensate for renegotiation and monitoring costs. The second interesting result is that banks demand payment for all types of sovereign risk in an identical manner public debt holders do. The difference is that, unlike bond holders, bankers have the possibility to charge an up-front fee to compensate for renegotiation costs. Hence, beyond the information related issues, the higher complexity of the pricing design makes bank loan optimal for lenders on sovereign capital markets, especially relative to public debt, thus motivating for their presence. The paper contributes to the expanding literature on loan syndication and banking related issues. The study also has relevance for the investigation of the developing countries debt pricing.

JEL Classification: F34; G21

Keywords: Private debt; Sovereign debt; Syndicated loans; Up-front fees; Non-linear pricing design.

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All errors are my own responsibility.

Empirical work strongly suggests that bank loans are different from corporate bonds in domestic as well as international capital markets. Authors have emphasized the renegotiation, screening and monitoring advantage of banks to explain this difference. In this paper, I provide evidence that banks also gain a valuable advantage associated with the complex contract design and the time at which payments are collected. Indeed, unlike private placement and bonds, the remuneration of bank lending is typically composed of a battery of fees and commissions along with the interest rate. Mills and Terrell (1984), Booth and Chua (1995) and Shockley and Thakor (1997) document that these fees, especially the up-front fee, drive substantial amounts. The up-front fee is a compensation that is paid out at the signature of the contract to lenders. Unlike other fees, it does not compensate for other services but lending (other fees include commitment, arranging, and agency fees).

I believe up-front payments contain an element of compensation for risks and renegotiation. Gorton and Kahn (2000) suggest that, unlike bondholders, bankers price the loan so that they minimize subsequent costs associated with moral hazard and renegotiation. As a consequence, initial loan pricing may involve transfers from the borrower to the bank in the form of up-front fees. Also, Thakor and Udell (1987) and Shockley and Thakor (1997) find evidence of the non-linear pricing on commitment facilities being associated with the presence of informational asymmetries regarding the creditworthiness of the borrower, up-front fees acting as a screening device. This is consistent with my findings.

However there are additional potential economic motivations for the non-linear compensations of bank credits. Conventional practice asserts that fees paid on the unused balance are aimed at reimbursing sunk administrative and commitment costs (Mills and Terrell, 1984)). Instead, empirical findings (see James, 1987; Lummer and McConnell, 1990; Chemmamur and Fulghieri, 1994) support the ability of financial intermediaries to collect private information on the borrower (see Fama, 1985; Diamond, 1991; Rajan, 1992). Provided interest premiums are typically the

publicized pricing component, this suggests that the non-linear pricing is aimed at voluntarily biasing the publicized interest premium so that interest rates would not reveal the private information. I do not find evidence suggesting that front-end payments are aimed at concealing information.

I investigate the design of bank loans contracted by sovereign states because the absence of enforceability means and collateral in these markets allows for the disentangling between renegotiation and default risks. Indeed, in a reputation-lending framework, private creditors deny future access to capital markets to sovereign defaulters (see Eaton and Gersovitz, 1981; Cole, Dow and English, 1995; Grossman and Han, 1999). The indebted government thus strategically considers either to negotiate new terms on existing bank debts or to default on both the bond and bank debts. There are no partial defaults nor assets liquidation. Therefore, I can easily isolate the renegotiation risks associated with temporarily shortage of cash (i.e. liquidity risks) from the default risks associated with insolvency (i.e. the debts exceed what the borrower will ever be able to repay).

Interestingly, studies on international debt markets show that, unlike bond yield margins, the interest margins on sovereign bank debts are insignificantly sensitive to indicators of liquidity default (Edwards, 1986; Boehmer and Megginson, 1990; Eichengreen and Mody, 2000). Arguably, authors claim that the small number of lenders and their cohesive behavior that features bank debts in contrast to dispersed bond holders, allow for cost free debt settlements (Folkerts-Landau, 1985; Bolton and Scharfstein, 1996). As a consequence, bonds margins include both the liquidity and the solvency risks while bank loans charge for default only. I do not question the renegotiation ability of banks. Instead, I claim this constitutes a valuable asset for the borrower that is in reality compensated front-end in the way described by Gorton and Kahn (2000). This is consistent with my results.

The findings are based on a relatively extensive and reasonably heterogeneous sample of bank loans contracted or guaranteed by LDC sovereigns in the fifteen-year period from January 1983 to December 1997. I find that the up-front fees pay for the expected costs associated with renegotiation and information asymmetries. By contrast, both the hypotheses of a fixed cost and concealed information relative to public debt markets are rejected.

The paper is related to the literature on the design of bank loans, focusing on the non-linear structure of pricing. The results highlight the advantage that bankers extract from the complex contract design compared with other capital markets participants.

The paper is also related to the literature on the role of financial intermediaries in capital markets, particularly in sovereign debts markets. The results highlight the renegotiation service that banks provide. The compensations are channeled through a more complex timing of compensations collection.

The paper proceeds as follows. In the next section, I provide some background in sovereign lending and bank credits and list the implications that would motivate the non-linear pricing of bank loans. After that, I present in section 2 the model of sovereign debt with and without exogenous pricing split-up and the empirical models. Section 3 describes the sampling procedure, the actuarial methodology, and the constructed database. The results are reported in section 4. I find strong support for fees being related to renegotiation costs (short-term risks) and information asymmetries. I report the robustness tests in section 5. In the final section I summarize the results and provide some concluding remarks.

1. Sovereign debt and bank loans – the theories and their implications

1.1. Contracting costs

The widespread argument among bankers is that the payment effected up-front is intended to guarantee the refund of administrative sunk costs. Mills and Terrell (1984) mentioned this point. I also frequently heard this argument during my interviews with syndicated loan managers. However,

such a justification of the custom has its limitations, especially in sovereign capital markets. First, there are no reasons to believe that the agent of the syndicate is unable to distribute fixed incomes to the providers according to the various interest margins (instead of a payment made up-front). Second, provided there exists no collateral, the amount paid up-front is reducing the probability of repayment of the same amount. The implicit higher interest margin (the so-called *all-in margin*) simply applies to the lower loan volume. Nevertheless, the refund of fixed-lending costs constitutes my first hypothesis.

1.2. Collusion between the debtor and the banker to bias interest margins

Previous authors have provided strong evidence of the ability of banks to collect inside information (e.g. Fama, 1985; Rajan, 1992) and empirical work confirmed this ability (e.g. James, 1987; Lummer and McConnell, 1989). Hence, other capital markets participants are likely to pay larger attention at bank loans pricing. Moreover, reports of bank loans in specialized banking reviews show that interest margins spreads receive more publicity than any other remuneration.

The interest premium may thus become a benchmark, the publicized loan rate being a creditworthiness proxy freely available. To the extent of my knowledge, I know no study that has investigated the impact of bank margins on bond yield premiums. Although this would be a very interesting topic, it is not yet my concern here. I will merely assume that this is a likely feature of capital markets. Provided this impact exists, the borrower and the lender may be tempted to bias the margin by creating side less significant payments such as up-front fees. By positively affecting the borrower's grading, the latter pay lower premiums on her public debts. Not only would this have a positive impact on the borrower's wealth, but also this creates a wealth transfer to bankers' assets value. Therefore, both the borrower and the lender have immediate interest in *colluding* and scatter the overall payment into various fees.

1.3. Compensations for expected renegotiation

The macroeconomic studies of the pricing of sovereign debts have produced questionable results. Folkerts-Landau (1985) argues that, by promoting the ease of renegotiating new terms on the loan contract, the reduced number of lending banks relative to bondholders promote the facility to renegotiate the terms on the liability contract. As what the author sees is a proof, the descriptive comparison between yield premiums on bond debts and interest spreads on bank loans shed light on larger bond yield premiums. Edwards (1986) extends the analysis and shows that public debt-holders charge significantly for liquidity risks, while bankers do not. Similar results are described in e.g. Boehmer and Megginson (1990), Min (1998), Eichengreen and Mody (2000).

However, the more complex workouts also make bond debts implicitly senior to private debt. This feature takes higher importance in the sovereign debt markets where, because of the lack of enforceability means and collateral, the seniority that is mentioned on contracts is eventually meaningless. Moreover, settlement is unlikely to be cost free so that I suspect that renegotiation prospects actually make the banking liability more sensitive to liquidity risks than bonds, which actually benefit from the liquidity insurance provided by bankers. Therefore, it is not clear whether the bank facility should bear lower costs than bonds and why liquidity risks have no impact on its price. I believe the absence of liquidity risks compensations in the sovereign bank debts interest margins is related to the sharper clear-cut between the cash shortage and the insolvency risks.

Indeed, more recent studies in domestic markets find that the smaller is the number of banks that fund new credit facilities, the larger is the impact on the value of the firm (Preece and Mulineaux, 1996). Banks are likely to provide renegotiation services. Also, Gorton and Kahn (2000) who view the banker as a renegotiation services provider, show that initial terms of the debt are not set to price default but rather are designed to balance bargaining power in later renegotiation. As a consequence, initial loan pricing may involve transfers either from the borrower to the bank in the form of front-end payments or from the bank to the borrower in the form of

under-priced services. Although the author's conclusions rely on the seniority of bank loans that is inexistent in sovereign capital markets, the banks can still threaten their debtor of a lending termination. This is actually in line with macroeconomic studies of sovereign loan pricing.

1.4. Screening device

Other explanations of the non-linear structure of bank loan pricing have relied on screening in asymmetric information environments (Thakor and Udell, 1987; Shockley and Thakor, 1997) with an application to loan commitments.[1] Indeed, the authors provide empirical evidence suggesting that fees paid on used balance are meant to screen in the presence of informational asymmetries. The takedown decision is contingent on the quality of the borrower's project. The intuition is that the lower quality investor will favor (usage) fees paid on takedown amounts since her probability of making use of the loan is lower. This indicates the borrower's investment quality. The empirical evidence reported by Shockley and Thakor (1997) is consistent with the self-selection pattern.

I believe the results can be extended to term loans contracted by sovereign states. Indeed, at every repayment date, the sovereign borrower can decide either to repay or default without any seizure threat on her assets. Opting for repayment guarantees the loan renewal while defaulting would instead restrict access to foreign capital. The borrower hence holds a put option on repayment flows until the maturity date, debt principal and interest installments constituting the payment for future capital. Given this feature, the lower quality borrower will favor higher interest margins because she can renegotiate or default them later on. Providing higher front-end payments would therefore signal the commitment to repaying in the future, given that the overall cost remains equal. Also, it signals the current liquidity availability and projects quality. Hence, the fourth possible motivation for front-end payments is related to agency problems and the asymmetric information the lender faces. Alongside the spread, bankers would use the up-front payments as a screening device in asymmetric information environment on a similar way as described by Shockley and Thakor (1997).

2. Empirical approach.

2.1. Sovereign loan pricing

In this section I suggest an extension of the sovereign risk-sharing model proposed by Feder and Just (1977), and subsequently extended by e.g. Edwards (1986), Boehmer and Megginson (1990), Min (1998). The model has been frequently used for sovereign debts pricing analyses and has become a standard model.

Assume the economy is a one-period economy composed of three agents, the sovereign and two bankers. Bankers are risk-neutral and compete on price. The sovereign agent seeks to borrow a certain amount q at date 0. At date 1, the borrower strategically defaults on principal and interest repayment with probability p. The unique alternative is the full repayment with probability 1-p. The creditor has no alternative but to accept the borrower decision. This follows the reputation hypothesis and the consequent credit disruption presented in the previous section.[3] The loan is remunerated by the interest rate composed of the floating benchmark free-rate i, usually the London inter-bank euro-currency rate (LIBOR) and the spread over the benchmark. For simplicity purpose I assume the refinancing interest rate and the treasury free-rate are equal. Suppose r is the mark-up. The expected value of the banker's present profit π is:

$$E(p) = -q + q(1+\frac{r}{1+i})(1-p)$$

Risk-neutral bankers compete on price r so that expected profits break even. r is therefore determined by an increasing function of the probability of default:

$E(\pi) = 0$ implies $$r = \frac{p}{1-p}(1+i) \qquad (1)$$

2.2. Sovereign loan pricing with an exogenous split-up

Alternatively, consider a contract in which, for some exogenous reasons (e.g. a collusion between the banker and her client), the borrower pays a share j of r in the form of a commission paid at date *0*. The new contract is defined by (q, r, j) where q is the loan size, r is the interest margin and j is the share of r paid out at the signature of the contract. The so-called *up-front fee* is then $j.r$. The outstanding share is still paid at date *1* as post-disbursement payment (or spread) S equals (1- j).r. The expected present profit is hence:

$$E(p) = q(1+\frac{(1-j)r}{(1+i)})(1-p) - q(1-jr)$$

Risk-neutral bankers compete on the so-called *all-in interest margin* r so that expected profits break even. r is therefore determined as an increasing function of the probability of default p and share j of the all-in interest margin r paid up-front:

E(p) = *0* implies $$r = \frac{p}{1-p}(1+i)\frac{1}{j(1+i)(1-p)^{-1} + (1-j)} \quad (2)$$

$$S = \frac{p}{1-p}(1+i)\frac{1-j}{j(1+i)(1-p)^{-1} + (1-j)} \quad (2')$$

Note that the equivalent loan contract (q', r, *0*) with size q' equals q(1- j r) and thus *0* up-front payments yields a higher all-in interest spread r':

$$r' = r.\frac{(1+ij)}{1-jr} > r \quad (3)$$

Specifically, when j equals zero we obtain the model described by Edwards (1986). When i and j equal zero, that is the contract modeled by Feder and Just (1977). r and S are therefore two decreasing convex functions on j and increasing concave functions on i. The more is paid up-front the smaller is the risk exposure. The remuneration is null when repayment is sure and goes to

infinite when the probability of default tends to one. The spread S as estimated in previous studies is thus substantially biased if there exists a share j of the remuneration paid up-front.

Since the decision variable is binary, let us assume the probability of default p is logistic distributed as a function of a set of exogenous macroeconomic determinants X:

$$p = \frac{\exp(b'X)}{1+\exp(b'X)}$$

The obtained natural logarithm of compensations on contract ($q,r,0$), i.e. without any exogenous split-up, is:

$$\ln r = b'X + \ln(1+i) \tag{4}$$

The log-remuneration of contract (q,r,j) i.e. with exogenous split-up, is:

$$\ln r = b'X + \ln(1+i) - \ln\left((1-j) + j.(1+i)\left(1+e^{b'X}\right)\right) \tag{4'}$$

$$\ln S = b'X + \ln(1+i) - \ln\left(1+\frac{j}{1-j}.(1+i)\left(1+e^{b'X}\right)\right) \tag{5}$$

As a result, the sign of the marginal impacts of exogenous factors on the all-in *and* the spread are identical. However, despite the identical sign, the share paid up-front has a different impact on each price term. Call $A(j,X) = [j\ (1+i)(1+e^{b'X}) + (1-j)] > 0$ for all real vector X and $0<j<1$,

$$\frac{\partial \ln r}{\partial X_i} = \frac{\partial \ln S}{\partial X_i} = b_i.\frac{(1+ij)}{A(j,X_i)}$$
$$\frac{\partial \ln r}{\partial j} = -\frac{i(1+e^{b'X})+e^{b'X}}{A(j,X)} < 0; \frac{\partial^2 \ln r}{\partial j^2} < 0$$
$$\frac{\partial \ln S}{\partial j} = -\frac{(1+i)(1+e^{b'X})}{(1-j).A(j,X)}$$

Hence, assuming the up-front fee is the result of a split-up of the risk premium, one would expect a negative impact of the share of the remuneration paid in the form of fees j on both the

spread and the all-in margin. This yields several implications for the specification of the empirical model.

2.3. The empirical model

The linear model

The specified linear model explores the determinants of the pricing elements on sovereign bank loans. The pricing elements are the all-in margin, the interest spread, and the up-front fee. For specificity purpose, the up-front fee is estimated as an equivalent yearly payment on used balances. The price term linear models are specified by:

$$\begin{aligned}\ln(\text{Price term}_{j,m,i}) = \text{Constant} &+ \Psi_0 . Dummies_{j,i,m} \\ &+ y_1 . \ln(1 + free\ rate_m) \\ &+ y_2 . Inflation_{m,i} \\ &+ y_3 . Liquidity_{m,i} \\ &+ y_4 . Solvency_{m,i} \\ &+ y_5 . Per\ capita\ income\ growth_{m,i} \\ &+ y_6 . Variability\ of\ growth_{m,i} \\ &+ y_7 . Gross\ investment\ to\ GNP\ ratio_{m,i} \\ &+ y_8 . Commercial\ debt\ share\ of\ public\ debt_{m,i} \\ &+ y_9 . LDC\ debt\ share of\ country's\ debt_{m,i} \\ &+ Error_{j,i,m}\end{aligned} \quad (6)$$

where a subscript *j* indicates that the variable refers to the *j*th contract. Similarly, a subscript *i* indicates a variable regarding the *i*th country, and *m* the issue date (month). Upper-case coefficients indicate vectors. Price term stands either for the *interest spread*, the *annualized up-front payment* or the *all-in margin*.

The dummies correct for the presence of specific terms on the contract and for the temporary adverse economic environment. Two dummy variables indicate the benchmark rate is respectively the US and Japanese primary rates. Time dummies correct for year 1995 that witnessed the Mexican crisis aftermath, and 1997-year end after the Thai currency had collapsed. The last dummy

indicates the presence of a *tax-spare clause* in the contract that states the interest payments on loan will not be subject to any withholding tax.

Liquidity is proxied by the amount of foreign currency reserves available to the sovereign relative to the public and publicly guaranteed (PPG) short-term debt. This indicator is inspired by Eichengreen and Mody (2000). The ratios of reserves relative to imports and the short-term debt relative to exports are two alternative variables. However, it turned out that the latter contains no additional information. The liquidity variable indicates the probability of a temporary foreign-currency shortage. In the sovereign debt perspective, this indicates default and the subsequent credit disruption is not necessarily maximizing the country's wealth. Instead, the sovereign will seek to renegotiate the loan arrangements. The liquidity variable, hence, indicates the perspective of renegotiation rather than debt repudiation. Therefore, the sign of y_3 is expected to be negative on all pricing values. However, liquidity impact was found insignificant on previous studies on sovereign debt spreads.

The *solvency* indicator is constructed as the ratio of the total amount of PPG long-term debt (the lifetime being longer than a year) relative to GNP. Solvency indicates the extent to which the total amount of liabilities is likely to be larger than expected cash flows. Should it be the case, reputation-based sovereign debt theories show that strategic default (repudiation) is the sovereign debtor's optimal decision. In previous studies the sign of y_4 was significantly positive on the spread. I expect similar results. Not necessarily should the impact be significant on the up-front fee.

The second set of exogenous variables is constituted of the country's macroeconomic fundamentals indicators that follow the recent empirical literature on sovereign and international risk, mainly Eichengreen and Mody (2000), Min (1998), Cantor and packer (1996), and Bohemer and Megginson (1990). The *inflation* is determined by the month-to-month yearly consumer prices growth in the issuing country. It indicates the monetary policy consistency. The sign of y_2 is expected to be positive on all pricing terms. *Per capita income growth* is calculated as the average

value of the GNP per capita yearly return over the last five years. The ratio of the gross domestic investment relative to the GNP indicates the long-run growth expectations as well as, to some extent, the government's commitment to development. The sign of y_5 is expected to be negative on all terms of pricing.

The two following variables are aimed at assessing the validity of the asymmetric information hypothesis to motivate non-linear pricing. The *variability of growth* is calculated as the variability of income per capita growth in the last five years. It captures the uncertainty on income. It also proxies for the amount of potential asymmetric information. y_6 is expected to be positive for both the interest spread and the fees. The impact on the spread indicates risk aversion while the impact on the fees will indicate the potential of agency costs. The ambiguous interpretation should be clarified with the use of an estimate of *how well known* the debtor is among creditors. This is proxied by the size of debtor's commercial debt relative to the overall LDC debt. The share of the private creditors' asset is similar to the variable defined as the book value of debt plus the market value of equity utilized by Shockley and Thakor (1997). The impact on the spread should be insignificant while I expect a negative impact on fees.

Finally, the share of bond debts relative to the total private creditors debt (bank loans and bonds) isolates the incentive for collusion between the sovereign and the banker so that the interest spread is publicized with a bias. The ratio indicates the weight of public markets in the sovereign private creditors debt and, therefore, the higher is the share, the higher is the incentive to conceal information. This will be consistent with a negative impact on the spread together with a positive impact on the up-front fees and the share of up-front payments in the combined remuneration. Possibly, this variable will create confusion with the cross-monitoring hypothesis tested by Booth (1992). This is why the collusion hypothesis will be consistent if the ratio has an insignificant impact on the combined cost, as well.

The extended linear model

The approach outlined above enables to identify the effect of the presence of asymmetric information and renegotiation risks on the spread and the up-front fee. In other words, this is the effect one expects should there be no trade-off between the spread and the fee, the size of the debt market testing for this. The extended model is derived from the marginal impact described by equation [5] :

$$\begin{aligned}\ln(\text{Margins}) = \text{Constant} + \Phi_0.X_{j,i,m} + f_0 \ln(1+ \textit{free rate}_m) \\ + f_1.\ln(\textit{Share})_{j,i,m} \\ + \textit{Error}_{j,i,m}\end{aligned} \quad (7)$$

where $X_{j,i,m}$ is the vector of explanatory variables as described above. *Share* is the calculated share of the all-in yearly payment paid front-end. *Margins* are the interest spread and the all-in margin. I test whether the fee results from an exogenous split-up agreed by the banker and her customer. This is consistent with the share having a negative marginal impact on both the spread *and* the all-in cost as described in Equations (4) and (5). Moreover, if this was true, there may be a co-linearity with the size of the public debt relative to the commercial debt, but not with other variables.

The non-linear model

Finally in a third extended non-linear specification, I focus more precisely on the collusion hypothesis. Because I find that the inclusion of the share paid up-front has a dramatic statistical effect on other explanatory variables, I want to verify whether the non-linear model outperforms the linear specification. The non-linear model specification follows equation [4] :

$$\begin{aligned}\ln(\textit{Spread})_{j,i,m} = \Gamma' X_{j,i,m} + \ln(1+ \textit{Freerate}_m) \\ - \ln\left[1+ \frac{\textit{Share}_j.(1+\textit{Freerate}_m)}{1-\textit{Share}_j}.\left(1+ e^{\Gamma' X_{j,i,m}}\right)\right] \\ + \textit{Error}_{j,i,m}\end{aligned} \quad (8)$$

where subscripts and variables are the same as described previously and *Share* is the share of the all-in cost paid up-front.

3. Sampling and data description

3.1. Sampling procedure

The sample of contracts is obtained from *IFR Platinum*, issued by *Thomson Financial*. I checked and completed the information by reading through the related articles in the *International Financing Review* (IFR), of which the *IFR Platinum* is the electronic version. There are two additional major sources surveying banking loan contracts, namely *Loanware* from Euromoney and *Loan Pricing Corporation* from Reuters Company.[4] I chose the IFR because it provides larger amounts of information regarding the borrower, the disbursements/repayments schedules, and the fees. In particular, the IFR also indicates for some contracts the respective amounts on which fees are to be paid so that I could calculate the average value of up-front payments.

I selected all loans *issued* or *guaranteed* by states, governments, monetary central authorities, and public enterprises and agencies situated in countries ranked as *low* or *middle income* by the World Bank in 1998 or 1999.[5] Non-guaranteed debts issued by public enterprises and agencies were retained where the debtor could reasonably be assimilated to a quasi-sovereign entity.[6] Notice that the selection of sovereign borrowers permits the exclusion of commercial risk to focus on specific sovereign risks. This is very important although almost absent in the previous literature. In the extent of my knowledge, Eichengreen and Mody (2000) first make the distinction. The authors indeed find a significant higher spread charged on international bank loans to private borrowers relative to sovereigns.

The second requirement in the contracts selection is a minimum amount of information regarding the size of the loan, the duration, and the interest rate. Loans were contracted between January 1983 and December 1997. Hence, of the 1750 contracts collected in the first place, only

781 had the appropriate prerequisites. However, of these 781 contracts, 679 are usable in the statistical analysis.[7]

The information recorded for each contract is the signature date of the contract, the identity, the type and geographic location of the borrower, the type and purpose of use of the loan, the currency of disbursement and repayment, the global, original and issued amounts in denominated currency and (current) US dollars. The disbursement and repayment schedule information includes the possible draw down and grace period, the number of tranches, the repayment frequency and period, bullet or balloon repayment. Interest payments are described by the fixed interest rate or the floating benchmark rate and the spread. All types of fees are indicated with the related amounts. However, provided that reports are often incomplete, a blank in place of fees remains ambiguous. This may mean fees were absent in the contract or the report was incomplete.

3.2. Calculation of the all-in margin

Beyond the interest margin, the all-in cost margin is an essential element for the acceptance of the loan. The calculation methodology, however, varies slightly according to the actuarial officer. This is why, except for a few exceptions, I follow the standard method suggested in Rhodes (2001), p. 136-144. It consists of the discounted cash-flows analysis where present values of every single cost is calculated and then annualized over the average life of the loan.

Hence, the first step consists of the determination of the discounting free rate. I selected redemption yield of the government benchmark bond associated with the currency and maturity of the contract. Yield values are monthly averages and the month is the signature month. Retaining monthly instead of daily values reduces the bias due to temporary shocks. Moreover, this is consistent with the typical timetable of the syndicate formation presented by Rhodes (2001), p. 149. Facility negotiations and allocations are made in the last four weeks preceding the closing date. Bond yields reports are compiled from *Datastream*.[8]

The second step consists of the calculation of the respective present value amounts paid in the form of fees and the interest rate spread. Notice that the spread may vary over the life of the loan. Annualizing all spread remuneration provides with the *average spread*. Previous studies have ignored this fact taking into account the first reported spread only. This gives higher support to this approach adopted in this study. Moreover, in a typical syndicated loan, compensations paid out at the signature date vary in basis points in function of the committed amount and the rank of the lender in the syndicate. The total front-end payments therefore are a function of the fees percentage-values and the number of banks at each rank. The IFR provides the former for each contract but not always the committed amounts nor the number of banks. Therefore, an average share of the front-end payments that is paid at each rank is calculated based on the sample of observations with complete information. This proxy is in turn used for the contracts with incomplete report.

The next step consists of the calculation of the average life of the loan.[9] Time is divided into monthly periods and for every single period I determine the outstanding disbursed amount. The sum of these values is divided by the size of the loan to obtain the *average lifetime.* Last, I annualize (i.e. calculate the internal rate of return of) the present values of each of the individual payments over the average duration. This provides the equivalent yearly margin over the benchmark interest rate on the utilization period of up-front payments. I add together this value to the interest spread so that I obtain the *all-in margin*, which is here the equivalent interest spread over the benchmark that comprises the designed interest spread and the annualized front-end payments.[10]

3.3. Description of the sample

The sample includes 679 observations of loan contracts from banks to LDC sovereign borrowers for which information is available on pricing structure (spread, index, and fees), loan size, term-to-maturity, and borrowing sovereign. 58 countries are represented. The oldest contract

was signed in January 1983 and the most recent in December 1997. This is a large number relative to previous studies. Indeed, Mills and Terrell (1984) based their study on a sample of 183 syndicated Euro-credits in the three year 1981-1983. Booth and Chua (1995) focused on a sample of corporate debt issued between 1987 and 1989. Last, Shockley and Thakor (1997) analyze loan commitments and lines of credits purchased in 1989 and 1990 in the US.

Summary statistics of the terms of the contracts in the sample are displayed in Table [1]. Frequencies and average values of costs of contracts are displayed by year and country in Table [2] and Table [3], respectively. The two principal issuers of sovereign loan contracts are Turkey (19.9% of the total number of contracts) and Brazil (16.8%). In (constant) dollar amount terms, Turkey also comes first (14.8%) followed by Mexico, Argentina, Brazil, and India. These five countries represent half of the total amount in the panel. This is consistent with figures reported in the World Bank's *Global Development Finance* (GDF). However, I find total volumes have a striking breakdown in the mid-eighties. Following their financial recovering during the late eighties, the major LDC sovereign loan issuers withdrew from the syndicated loan market and turned to public bond markets. For example, GDF report that only 5% of Brazilian international debt contracted from private creditors was in the form of bonds in the early 1990s. In 1996, it represented 82%. The debt on Argentina and Mexican followed a similar pattern.

Of the 679 contracts, 435 are reported with the up-front fees. The average share in the overall sample is of 19.4% of the combined remuneration. Up-front fees amount to 0.743% on average, representing US$ 1.1 million (in 1995 constant US dollars) in an average 153 million US dollar loan. The average fees payment is also very heterogeneous among countries. An extreme case is Nigeria, which paid 4.33% of the loan amount in flat fees. This was superior to the mark-up remuneration itself.

The findings are consistent with previous studies. Although the level of the spread and the equivalent margin fee in percentage are lower in their sample, Mills and Terrel (1984) find up-front

fee pay for 19% of total return of the public debtors Euro-credit loans. The figure is similar in my sample. Alternatively, Booth and Chua (1995) find that the average up-front fee on term loans amounts to 1.05%. This is 40% higher than the up-front payment on sovereign private debt. The authors also report 47% of their sample with up-front fee while my sample of sovereign loans report the presence of such a fee on 65% of the contracts. Finally, Shockley and Thakor (1997) find only a mean up-front fee of 26% on loan commitments to US publicly traded firms. Interestingly, the difference is function of the type of debtor and the likely amount of public information. I find similar results. Moreover, the high amounts of money driven by up-front fees along with their heterogeneity constitute a preliminary evidence of the little relevance of the contracting cost hypothesis and give credit to the creditworthiness and asymmetric information hypotheses. The next section presents the results of the estimates and their interpretation.

4. Empirical results

4.1. Estimation

All contracts are considered individually. This allows a direct analysis of the interaction between the terms designed on the contract. The fundamentals indicators are implemented as exogenous variables. Their number has been simplified relative to previous studies. This is intended to avoid any misspecification due to multi-colinearity. Therefore, every factor is proxied by one variable. Tests of multi-colinearity are run after every estimate to ensure the validity of results. I use the *variance inflation factors* test.

Exogenous macroeconomic and debt indicators are obtained from the international development organizations which provide high quality public information on most of LDCs. Indeed, data are obtained from reports provided by local authorities and specialized internal economists. Consumer prices growth monthly data stem from the *International Financial Statistics*, published by the IMF. All other variables are collected on a yearly basis from the tables provided by the *Global Development Finance* and the *World Development Indicators*, both published by the World Bank.

The World Bank's tables present the advantage of being homogenized and thus more convenient (relative to the IMF tables in particular). Missing figures are obtained from the *IMF* and *World Bank* country surveys, the joint tables jointly published by the IMF-World Bank-OECD-BIS[11] and various *Economist Intelligence Unit Country Reports.* See appendix for further details. However, missing values in the accounting variables restrict the sample. This explains the difference in the number of observations.

4.2. Funding costs and price disclosure

Table [4] summarizes the OLS estimates of the model's parameters. The dependent variable in columns (a), (b) and (d) is the logarithm of the average spread over the basis interest rate. The dependent variable in columns (c) and (e) is the logarithm of the all-in margin which combines the interest spread and the up-front fees. The first estimated models reported for the spread and the all-in margin, all independent parameters are implemented. None of other contract terms are implemented. Column (a) shows that the spread responds significantly to all indicators except *Liquidity.* The insignificant impact of *Liquidity* is consistent with previous results presented by Edwards (1986) and subsequent studies of the spread on sovereign debt in LDCs. On the other hand, long-term indicators, *Solvency* and *dIncome,* are as expected significant at the level 0.01, with high *t*-statistics respectively of 4.03 and -4.14. However, the presence of a large public debt market drives both the spread and the combined all-in margin down at the significance level 0.01. This contradicts the collusion hypothesis. Interestingly, this is consistent with the cross-monitoring hypothesis presented in Booth (1991). The size of the debtor liabilities in the LDC debt market has a significant positive impact on the spread and the combined all-in yearly margin. This result is probably consistent with risk exposure issues instead of asymmetries of information. The participants in capital markets being already highly exposed (large ratio), they request a higher lending premium.

The estimated all-in margin that combines up-front fees and interest spread in a yearly equivalent margin is significantly determined by all factors. Results, hence, contrast with the spread model estimates. Although being larger than its significance impact on the interest spread (0.954), 0.22 is a low significance of *liquidity* in statistics standards. Nevertheless, withdrawing *Liquidity* yields a substantial loss in the *R*-squared value. Therefore, the final model keeps this variable. Generally speaking, short-term and volatility indicators have a higher impact on the all-in margin. Long-run solvency have a lower impact. This provides preliminary evidence of the short-term factors being, indeed, remunerated through front-end payments. This contrasts with previous results. The interpretation of non-enforceability presented in Folkerst-Landau (1985), Edwards (1986), and Boehmer and Megginson (1990) are therefore likely to be inconsistent with the new data. Note the presence of a larger bond market also result significantly in a lower all-in remuneration at similar levels. This is inconsistent with the collusion hypothesis that predicts the size of the bond market should have an impact on the spread and fees separately, but not the combined payment. Instead, this is consistent with the cross-monitoring results presented by Booth (1992).

Therefore, findings provide evidence of the collusion hypothesis being unlikely to determine the presence of up-front fees. Besides, the managing costs will probably determine to some extent the charges paid out at the signature by the borrower but is probably accompanied by other factors.

4.3. Renegotiation and agency costs

In columns (d) and (e) of Table 4, the share of the up-front payment is included in the model as an explanatory variable. This is intended to test the linear marginal impact as reported in equation [5]. Figures show that the share of the premium paid up-front has an opposite impact on spread and all-in margins. It is respectively negatively and positively significant at the level .01, with *t*-statistics of -3.76 and 2.75, respectively. This provides mixed evidence on fees resulting from the exogenous split of risk-remuneration. Equations [4] and [5] suggest that if the determination of the

share was exogenous, it would have a negative impact on both the spread and the all-in. Moreover, the introduction of the share implies very different results suggesting strong multi-collinearities between the share and various indicators in particular indicators of liquidity shortage, variability of revenues, level of investment, and the size of the borrower's debt relative to the total LDC debt. It is therefore likely that the endogenous fees are determined by these factors.

The linear regressions on up-front fees are presented in the second part of Table [4]. The dependent variable in columns (f) and (g) is the logarithm of the weighted mean of the up-front fees face value in percentage. The dependent variable in columns (h) and (i) is the logarithm of the equivalent margin in percentage above the floating basis rate. The dependent variable in columns (j) and (k) is the logarithm of the share of the debt combined cost (up-front fees and interest spread) paid up-front. The calculations of weights and present values were described in section 4.2. Results show strong evidence of fees being risk related. In both regressions on the face value and the equivalent margin, liquidity, growth of GNP per capita, variability of income are significant at level 0.01. The signs are consistent with hypotheses. The face value of fees are significantly influenced by national investments and the size of the bond market, while inflation has a positive significant impact on the up-front fees calculated as a margin. The share of the total debt of the debtor in the total less-developed countries debt provides significant but contradictory results. It has a positive impact on the face value, whereas it is negative on the equivalent margin.

Therefore, there is strong evidence of up-front payments being determined by renegotiation costs while the repudiation risk is insignificant. This gives support to analyses like Gorton and Kahn (2000). Moreover, the up-front fee is also associated with information availability (MktSize) and factors of asymmetric information (VdIncome). This is consistent with Shockley and Thakor (1997).

5. Robustness

5.1. Other terms in the contract

Regressions of the face value and equivalent fees on other terms of the loan contract are presented in Table [5]. The estimates replicate the model presented by Mills and Terrell (1984) and estimated with a sample of loans issued during the period 1981-1983. I too find a highly significant relationship between the fees in face value or equivalent margin form and the spread and the duration of the loan. The estimated average life is actually of a lower explicative performance. These results are similar to the ones described by Mills and Terrell (1984). The authors interpreted these results as evidence of fees functioning as a device for service compensation along with hiding information to public markets, namely the fixed-cost and the inside information hypotheses. In the light of the results reported in table [4], the positive impact of the spread on the fees is likely to be due to colinearity. I showed there were outstanding differences despite the set of common macroeconomic factors. Error terms also respond poorly to normality tests, while the normality hypothesis of the error terms predicted by model (*i*) in Table [4] are not rejected at standard significance levels.

Moreover I make a separate estimate of the determinants of the share of the yearly premium paid up-front. The OLS estimates of the share of the remuneration paid up-front is presented in the second part of Table [4], columns (*j*) and (*k*). The significance of the equation is rather low. The indicators of liquidity holding and uncertainty regarding revenues are both statistically significant at the level .01, with *t*-statistics of -6.38 and 3.22, respectively. The size of debt is here too negatively significant at level 0.01. Unsurprisingly, the results are similar to the model related to the annualized up-front fee reported in columns (*h*) and (*i*). However, statistic diagnosis show poorer performance of error terms in particular.

5.2. Selectivity bias

My sample of syndicated loans is by no means comprehensive nor is it necessarily a random selection of the population. For instance, if the willingness of the issuers or arrangers to share data is to some extent related to the success of syndication or some other characteristics, estimates based on such data might be biased. To explore whether selectivity bias is a concern, I use a Heckman (1979) model. I calculated the difference in the mean values and the estimates of the new model. I remind that of the 679 observations with a reported spread, 244 have no fees reported.

The selection equation relates the probability of the inclusion of the fees in the report to the potential public access to information and motivations for hiding. The facility for public access to information is proxied by the size of the issuing country (GNP), size of the loan, dummy for the type of borrower (pure sovereign *vs.* quasi-sovereign and public companies). The motivation for keeping information undisclosed is proxied by the size of the bond market and the level of interest spread itself (risky borrower). I use a probit of the full sample. Results show that apart from the interest mark-up, none of the factors have an impact on the reported fees. Moreover, despite the impact all coefficients equals zero cannot be rejected, individual coefficients are insignificantly modified. Hence, although the sample is not as comprehensive as one would like, I find no compelling evidence of selectivity bias.

5.3. Estimate of the extended non-linear model

In this section the least-squared estimates of the non-linear model described by equation [8] are presented. I implement the non-linear ordinary least squared model with Stata®. Starting values are derived from Table [4]. Results are reported in Table [6].

Respective coefficients associated with *Inflation*, *Liquidity*, *Solvency*, *dIncome* and *V(dIncome)* are found to be significant at the level 0.03, with *t*-statistics of 3.67, -2.56, 2.15, -2.29, and 3.44. Respective signs are consistent with the hypotheses. The size of the debt market relative to the LDC debt market and the share of bonds in the country's debt financing are found to be irrelevant to

explain the spread. However, normality tests on the error terms perform poorly and therefore should be rejected. This adds further evidence of the up-front fees being unlikely to result from a collusion between borrowers and bankers to mislead capital markets actors.

5.4. Endogeneity of the interest spread payments

Interestingly, the spread paid on top of the basis interest rate may have some impact on the managing costs. For instance, the riskier borrower could yield higher administrative costs for the banker for executive meetings as well as information collection. The fees may too be a determinant of the spread if it acts as a price adjustment. To examine this possibility, I test for the endogeneity of the spread using the augmented regression procedure suggested by Hausman (1976). The test is based on the null hypothesis that the impact of the error term regressing the log of spread on all exogenous factors in equation (6) has an insignificant impact on the log of up-font. Results show that the null hypothesis that the interest spread is exogenous cannot be rejected (*p*-value equals 0.858). Alternatively, OLS is a consistent estimator for the model.

5.5. A thorough comparison with public markets

To provide further evidence on the little explanatory power of the inside information hypothesis to explain the non-linear pricing, I do a contract-by-contract comparison of the pricing on pairs of bonds and loans which will present sufficient common characteristics. Indeed, previous literature has failed in determining which of a syndicated and a bond loan presents a higher spread. Both comparative studies presented by Folkerts-Landau (1985) and Eichengreen and Mody (2000) help very little since they are based on pooled data sets. They are designed to highlight the respective determinants of spreads on bank loans and primary bond issues instead of determining which of the two presents higher spreads. The sample of public debt primary issues is constituted of all euro-currency primary issues of public loans launched by LDCs sovereigns during the period 1983-1997. They are floating rate denominated so that the spread can be compared more easily. All bonds are issued between 1983 and 1997. Descriptive statistics are presented in Table [7].

I calculate the difference between the spread designed on syndicated loans and bonds at the primary issue date. Both types of loans display the same floating index and the lifetime is similar. The descriptive figures are displayed in Table [8]. The figures are displayed in function of the number of days separating the two issues. Results show that spreads on bank loans are higher than spreads on floating-rate bonds in general.[12] The findings contrast with Eichengreen and Mody (2000), which find primary issues bond spreads in their sample three times as large as syndicated loans spreads. Presumably, the difference is related to the little accuracy of the latter study resulting from the use of monthly-pooled data.

For further details, Table [9] reports relevant terms of paired banks and bond debts launched in a less than 60 days window. Pairs of floating-rate notes are constituted of 25 syndicated loans and 24 bonds. None of the eleven pairs of contracts designed with a similar currency and basis rate have lower spread on bank loans. The sample of fixed-rate notes is constituted of six bank loans and eight bond issues. For facility reasons, the pairs of fixed interest rate loans are not reported in the table. Again, fixed interest rates charged on bank loans are found at least as high as public debt interest rates. Interestingly, larger spreads are associated with more troubled periods. Therefore, the descriptive analysis provide further evidence of up-front fees being unlikely to be intended to downward bias publicized interest margins in the attempt to misprice bonds.

6. Summary and concluding remarks

The paper suggests an innovative contribution to the investigation of the complex non-linear pricing of bank liabilities. The analysis is conducted in the sovereign debt markets where proxies for liquidity and solvency risks are more easily separable. By focusing on the determinants of the up-front fees (the up-front fee is a charge paid out at the signature date), the study addresses fundamental issues of the role of financial intermediaries, especially being a renegotiation insurer. It also looks at the potentiality for non-linear pricing to be a screening device, thus providing the banker with a contracting advantage. The investigation is based on a uniquely extensive sample of

bank loans contracted or guaranteed by 58 less-developed countries sovereigns in the period between January 1983 and December 1997. The well-detailed reports allow for the calculation of the equivalent yearly margin on the utilization period for each individual loan.

The main findings suggest a strong impact of the renegotiation costs on front-end borrowing payments while they hardly affect the interest mark-up. Interestingly, this is consistent with previous studies on sovereign international loans that focused on the sole interest spread. This is also consistent with Gorton and Kahn (2000) who predict that front-end payments compensate for renegotiation and monitoring costs.

The second interesting result is that front-end payments are larger in an asymmetric information environment in similar manner as in Shockley and Thakor (1997). Namely, the banker uses front-end payments to screen among borrowers of different creditworthiness. The lower quality borrower will favor higher interest margins because she can renegotiate or default them later on. Paying out larger compensations front-end would therefore signal the commitment to repaying in the future as well as the quality of the borrower's projects, provided the overall cost remains equal.

The inability to establish which of the screening and the liquidity insurance compensations is the main economic motivation for the non-linear pricing constitutes the main shortcoming of the paper. It should not however limit the contribution of my findings, namely that the ability of banks to create a complex non-linear pricing on their assets makes the latter special in capital markets. Whether this demonstrates that banks are rather liquidity insurer or that this constitutes an efficient signaling device making banks different deserves further investigation. I believe that the two hypotheses are not competitive though, and therefore front-end payments are used in both means. This should stimulate new avenues of research.

By contrast, the results strongly rejects that the non-linear pricing is meant to bias publicized interest rates. The results also reject the attempt of the bankers to obtain administrative costs repayment front-end. If ever, these should be related to future renegotiation administrative costs.

The findings also relate to the role of banks in sovereign debts markets. As a matter of fact, by contrast to previous studies, I find that banks demand payment for all types of default as well as renegotiation risks in identical manner public debt holders do. The difference is that, unlike bondholders, bankers have the possibility to design complex non-linear compensations so that renegotiation costs are paid out in the first place and also that bankers are more able to screen out sovereign debtors, which commit to repaying. Hence, the higher complexity of the pricing design to some extent provides economic motivations for the presence of sovereign bank debts although they benefit from no seniority.

Appendix: List of Exogenous Variables and Data Source

i	International free rate calculated as the Treasury Bill yield for the associated currency and maturity. Monthly average. Source: *Datastream*, Thomson Financial
Inflation	Yearly consumer prices growth in the issuer economy. End of month. Source : *The International Financial Statistics*, IMF.
Liquidity	Reserves of foreign currencies relative to public and publicly guaranteed short-term debt of the issuer. End of year. Source: *Global Development Finance*, The World Bank.
Solvency	Public and publicly guaranteed debt to GNP in the issuer economy. End of year. Source: *Global Development Finance*, The World Bank.
dIncome	Five years average of GNP per capita growth in the issuer economy. End of year. Source: *Global Development Finance*, The World Bank. For country i, year $j = 0$, $dIncome_{i,j} = \sum_{j=-4}^{0} \frac{Incomegrowth_{i,j}}{5}$
V(dIncome)	Five year variability of GNP per capita growth in the issuer economy. End of year. Source: *Global Development Finance*, The World Bank. For country i, year $j = 0$, $V(dIncome)_{i,j} =$ $\sum_{j=-4}^{0} \frac{\left(\text{GNP per Capita growth}_{i,j} - \textit{Average}\ \text{GNP per capita growth over the last 5 years}_{0}\right)^2}{5}$
Investment	Yearly gross domestic investment relative to GDP. End of year. Source: *World Development Indicators*, The World Bank.
MktSize	Amount of private creditors debt of the issuing country relative to the total amount of the private creditors contracted by all less-developed countries. End of year. Source: *Global Development Finance*, The World Bank.
Bond	Issuing country amounts of outstanding public and publicly guaranteed bond debt relative to the sum of banking and bond debt amounts. End of year. Source: *Global Development Finance*, The World Bank.
Tax-Spare	Clause on the loan contract that prevents from with-holding tax payments. Source: *The International Financing Review*, Thomson Financial.

[1] Also called *revolving credit* or *line of credit*. The loan commitment is a special type of loan where the bank *commits* to pay out the loan amount at any time the borrower desires until maturity. The loan is typically accompanied by a series of fees paid either *before* or *after* disbursements along with the interest rate.

[2] See for example the riots in Caracas that took place in February-March 1989 and the related speech of President Perez reported in the *Financial Times* March 4, 1989. Also, what happened more recently in Argentina, *The Economist* January 17, 2002.

[3] This is also consistent with the observation that the "negative pledge" and the "*pari-passu*" clauses are two standard covenants usually included in international bank loan contracts. See Wood (1995) 16-10 to 16-12 for further details.

[4] See Rhodes (2001) Appendix II for a complete listing of commercial databanks.

[5] Income based country ranking is function of *per capita* incomes. In 1999, *middle-* and *lower-income countries* rankings apply to countries for which *per capita* income in 1997 was below US$ 9,655.

[6] If necessary, the status is verified in the Articles of the company, where it should be written that the state would make sure the company will meet its (foreign) obligations. This is usually the case of national development banks, e.g. the Korean Development Bank, and national primary resources monopoles, e.g. the Sonatrach in Algeria.

[7] 3 contracts include security clauses, 30 are revolving credits, 62 contracts are fixed rate loans. The reason why fixed-rate loans were discarded is that I found inconsistently low interest rates with respect to the related free-rates. Moreover, the 2 loans denominated in Kuwait Dinar were deleted because I had no Kuwaiti benchmark free-rate.

[8] For limited issues reasons, 3 loans denominated in Swiss Francs and 9 in Austrian Sterling had no benchmark bond yields for the related maturity. For these contracts only, I selected the respective "official" 10-years benchmarks.

[9] Note that Mills and Terrell (1984) considered the overall loan lifetime. This results in a downward bias.

[10] Typically the all-in cost includes all costs. For simplification purpose, I use the same straightforward meaning term.

[11] Internet address: *http://www1.oecd.org/dac/Debt/*

[12] I deleted the outlying observation for the Argentine Republic in 1995 for which I found a negative difference amounting to -270 basis points.

References

Boehmer, E. and W.L. Megginson, 1990, Determinants of Secondary Market Prices for Developing Country Syndicated Loans, The Journal of Finance 45(6), December, 1517-1540.

Bolton, P. and X. Freixas, 2000, Equity, Bonds, and Bank Debt: Capital Structure and Financial Market Equilibrium under Asymmetric Information, The Journal of Political Economy 108(2), April, 324-351.

Bolton, P. and D.S. Scharfstein, 1996, Optimal Debt Structure and the Number of Creditors, The Journal of Political Economy 104(1), February, 1-25.

Booth, J.R., 1992, Contract Costs, Bank Loans, and the Cross-monitoring Hypothesis, Journal of Financial Economics 31, 25-41.

Booth, J.R. and L. Chua, 1995, Structure and Pricing of Large Bank Loans, Federal Reserve Bank of San Francisco, Economic Review 3, 52-62.

Bulow, J. and K. Rogoff, 1989, Sovereign Debt : Is to Forgive to Forget?, American Economic Review 79, 43-50, March.

Cantor, R. and F. Packer, 1996, Determinants and Impact of Sovereign credit Ratings, Federal Reserve Bank of New York Economic Policy Review, October, 37-53.

Chemmamur, T.J. and P. Fulghieri, 1994, Investment Bank Reputation, Information Production, and Financial Intermediation, Review for Financial Studies.

Cole, H.L., J. Dow and W.B. English, 1995, Default, Settlement, and Signaling: Lending Resumption in a Reputational Model of Sovereign Debt, International Economic Review 36(2), 365-385.

Davidson, R. and J.G. McKinnon, 1993, Estimation and Inferences in Econometrics, Oxford University Press, Oxford.

Delaume, G.R., 1994, The Foreign Sovereign Immunity Act and Public Debt Litigations: Some Fifteen Years Later, The American Journal of International Law 88, 257-29.

Diamond, D.W., 1991, Monitoring and Reputation: the Choice between Bank Loans and Direct Placed Debt, Journal of Political Economy, Vol. 99, August, 689-721.

Eaton, J. and M. Gersovitz, 1981, Debt with Potential Repudiation: Theoretical and Empirical Analysis, Review of Economic Studies 48, 289-309.

Edwards, S., 1986, The Pricing of Bonds and Banks Loans in International Markets, European Economic Review 30, 565-89.

Eichengreen, B. and A. Mody, 2000, Lending Booms, Reserves and the Sustainability of Short-term Debt: Inferences from the Pricing of Syndicated Bank Loans, Journal of Development Economics 63, 5-44.

Fama, E., 1985, What's different about Banks?, Journal of Monetary Economics 15, 29-39.

Feder, G. and R.E. Just, 1977, An Analysis of Credit Terms in the Eurodollar Market, European Economic Review 9, 221-43.

Folkerts-Landau, D., 1985, The changing Role of International Bank Lending in Development Finance, IMF Staff Paper 32, 317-363.

Gorton, Gary and James Kahn, 2000, The Design of Bank Loans Contracts, Review of Financial Studies 13(2), pp. 331-364.

Greenwood, C. and H. Mercer, 1995, Considerations of International law, in: B. Eichengreen and R. Portes, eds., Crisis? What Crisis?, Annex 3 (CEPR, London), 103-117.

Grossman, H.I. and T. Han, 1999, Sovereign Debt and Consumption Smoothing, Journal of Monetary Economics 44, 149-158.

Hallak, I., 2003, Courts and Sovereign Eurobonds: Effects of Judicial Enforcement on Sovereign Credit Markets, mimeo, Center for Financial Studies.

Hausman, J.A., 1976, Specification Tests in Econometrics, Econometrica 46, 1251-1271.

Heckman, J., 1979, Sample Selection Bias as a Specification Error, Econometrica 47, 153-161.

James, C., 1987, Some Evidence of the Uniqueness of Bank Loans, Journal of Financial Economics 19, 217-35.

Lummer, S.L. and J.J. McConnell, 1989, Further Evidence on the Bank Lending Process and the Capital-Market Response to Bank Loan Agreements, Journal of Financial Economics 25, 99-122.

Mills, R.H. and H.S. Terrell, 1984, The Determination of Front-end Fees on Syndicated Eurocurrency Credits, International Finance Discussion Papers, No. 250, October.

Min, H.G., 1998, Determinants of Emerging Markets Bond Spread : Do Economic Fundamentals Matter?, World Bank Policy Research Working Paper 1899, March.

Preece, D. and D.J. Mullineaux, 1996, Monitoring, Loan Renegotiability, and Firm Value: the Role of Lending Syndicates, Journal of Banking and Finance 20, 577-593.

Rajan, G.R., 1992, Insiders and Outsiders: The Choice between Informed and Arm's-Length Debt, The Journal of Finance 47(4), September, 1367-1400.

Repullo, R. and J. Suarez, 1998, Monitoring, Liquidation, and Security Design, The Review of Financial Studies 11(1), 163-187.

Rhodes, T., ed., 2001, Syndicated Lending, Practice and Documentation (3rd ed.), Euromoney, London.

Rose, A., 2002, One Reason Countries pay their Debts: Renegotiation and International Trade, CEPR Discussion Paper No. 3157, January.

Shockley, R.L. and A. V. Thakor, 1997, Bank Loan Commitment Contracts: Data, Theory, and Tests, Journal of Money, Credit, and Banking 29(4), November, 517-34.

Stone, M., 1991, Are Secondary Debt Market Returns Sensitive to Macroeconomic Fundamentals? Evidence from the Contemporary and Interwar Markets, Journal of International Money and Finance 10, S100-22.

Thakor, A.V. and G.F. Udell, 1987, An Economic Rational for the Pricing Structure of Bank Loan Commitments, Journal of Banking and Finance 11, 271-289.

Wood, P.R., 1995, Project Finance, Subordinated Debt and State Loan, (Sweet&Maxwell, London).

***Table 1*. Summary statistics for the period 1983-1997 of the non-linear pricing of sovereign bank loans**

Statistics values of the terms on the syndicated loan contracts to LDC sovereigns during the period, 1983-1997. Spread is the average spread over the loan lifetime; Up- front fees is the weighted average of up-front fees in percentage; Annualized values are the estimated equivalent yearly margin on the utilization period; Combined all-in margin is the equivalent yearly margin that combines interest spreads and up-front fees. All mean costs values are reported in percentage. Lifetime is the lifetime of the loan in number of years; Amount is the size of the issue in million of constant 1995 US dollars.

Items	Observations	Mean	Std. Dev.	Min.	Max.
Spread	679	1.110	0.792	0.100	6.330
Up-front fees	435	0.743	0.772	0.000	5.210
Annualized up-front fees	435	0.297	0.349	0.000	3.160
Combined all-in margin	679	1.340	0.936	0.100	7.810
Lifetime in years	679	6.870	3.570	0.250	25.25
Size (1995 million US$)	679	153.0	452.0	0.015	7666

Table 2. **Interest spreads and shares of the remuneration in the form of up-front fees by year**

Distribution and mean values of spread and share of remuneration in the form of up-front fees by signature year on the syndicated loan contracts to LDC sovereigns during the period, 1983-1997. *Observations* is the number of observations; Mean is the mean value; Spread is the average spread over the loan lifetime (percentage); Share is the share of overall remuneration (spread and up-front fees) paid in the form of up-front fees (percentage).

Year	Observations		Mean		Year	Observations		Mean	
	Share	Spread	Share	Spread		Share	Spread	Share	Spread
1983	74	114	22.0	1.051	1991	16	26	30.0	0.790
1984	69	109	16.5	1.481	1992	18	26	30.1	1.078
1985	46	80	14.3	1.338	1993	21	30	20.0	1.085
1986	26	41	18.1	0.759	1994	11	15	19.7	1.025
1987	26	51	19.0	0.924	1995	20	25	19.0	1.725
1988	28	39	19.9	0.655	1996	23	33	13.2	0.812
1989	12	19	19.7	0.631	1997	28	47	16.7	1.498
1990	17	25	27.6	0.586	Total	435	679	19.4	1.111

Table 3. **Non-linear structure of pricing of bank loans for the period 1983-1997 by country**

Obs. is the number of observations; Spread is the mean spread over the loan lifetime (percentage); Share is the mean share of the combined remu neration (spread and up-front fees) paid up-front (percentage); Fees is the mean weighted average value of the up-front fees (percentage).

Country	Obs.	Spread	Share	Fees	Country	Obs.	Spread	Share	Fees
Algeria	10	0.688	15.0	0.526	Mauritius	1	3.000	.	.
Antigua	1	2.500	1.20	0.125	Mauritania	1	1.500	24.0	1.266
Argentina	9	1.408	17.0	0.542	Mexico	5	2.410	15.6	1.012
Burundi	1	1.875	27.5	1.500	Nigeria	15	0.867	54.7	4.330
Brazil	114	1.977	13.3	1.350	Nepal	1	1.250	13.6	0.559
Barbados	4	1.311	8.80	0.498	Oman	10	0.437	17.8	0.334
Chile	3	1.500	.	.	Panama	3	2.167	18.8	1.500
Congo	6	1.729	27.6	1.600	Peru	1	2.250	7.50	0.750
China	22	0.698	18.5	0.545	Philippines	12	1.207	7.20	0.367
Cameroon	2	0.875	8.20	0.377	Pakistan	27	.9765	16.1	0.378
Colombia	18	1.324	13.0	0.839	Paraguay	3	2.000	22.3	1.482
Czech Rep.	1	0.450	6.00	0.068	Romania	1	5.600	.	.
Ecuador	2	0.688	15.8	0.554	Russia	4	4.769	12.5	0.334
Ethiopia	1	0.750	.	.	South Africa	12	0.573	15.8	0.205
Gabon	3	1.041	21.4	1.070	Seychelles	1	2.000	21.7	0.807
Ghana	4	0.725	45.6	0.551	South Korea	31	0.483	29.1	0.762
Hungary	9	0.603	29.3	0.563	Sri Lanka	2	1.062	13.2	0.375
Indonesia	2	1.500	4.50	0.300	Slovak Rep.	3	0.708	8.60	0.302
India	55	0.385	16.0	0.334	Soviet Union	1	0.875	.	.
Iraq	2	0.875	.	.	Slovenia	5	1.012	7.40	0.277
Ivory Coast	2	1.688	19.9	1.828	Thailand	22	0.694	16.5	0.344
Jamaica	3	1.250	.	.	Turkey	135	1.115	23.4	0.637
Jordan	8	0.594	16.1	0.467	Trinidad	10	1.294	17.1	0.533
Kazakhstan	1	3.250	4.50	0.317	Tunisia	21	0.624	15.7	0.418
Kenya	2	0.750	52.6	0.454	Tanzania	3	1.333	47.9	1.125
Lithuania	1	2.500	28.8	0.500	Uruguay	1	1.625	.	.
Malaysia	42	0.335	13.8	0.270	Venezuela	3	1.542	11.6	0.500
Macedonia	1	4.000	14.4	0.500	Zambia	1	1.500	.	.
Morocco	3	1.292	15.0	0.148	Zimbabwe	12	0.835	44.2	0.488

***Table 4*. Models estimate**

Regression estimates of banking contracts pricing terms on macroeconomic indicators. The dependent variables in columns (a)-(b) and (d) is the logarithm of the average spread over the basis interest rate. The dependent variable in columns (c) and (e) is the logarithm of the equivalent margin above benchmark that combines the interest spread and up-front fees. Exogenous variables are: i is the government currency-and-maturity related monthly average bond yield; Inflation is the yearly month-to-month consumer prices increase; Liquidity is the foreign currencies reserves to short-term debt ratio, p-test (rejection probability) in parentheses; solvency is the ratio of public and publicly guaranteed long-term debt to GNP; dIncome is the last five years GNP-per-capita returns average; V(dIncome) is the variability of income per capita return in the last five years; Investment is the national gross investment to GNP ratio; MktSize is the share of the country private creditors debt relative to all LDC debt. Bond is the share of private creditors debt in the form of bonds; Tax-Spare indicates the presence of a clause exempting from withholding tax. *t*-statistics in square parentheses.

Regressors	(a)	(b)	(c)	(d)	(e)
ln(l+i)	-2.683**	-2.470**	-2.871**	-0.612	-1.107
	[-2.240]	[-2.450]	[-2.380]	[-0.460]	[-0.830]
ln(Share)	-	-	-	-0.150***	0.109***
				[-3.760]	[2.748]
Inflation	0.213***	0.214***	0.193***	0.402***	0.377***
	[4.541]	[4.600]	[4.081]	[4.958]	[4.674]
Liquidity	-0.001	-0.022	-0.031	-0.035	
	[-0.018]	[-1.220]	[-1.350]	[-1.500]	
Solvency	0.567***	0.587***	0.507***	0.587***	0.541***
	[4.027]	[4.612]	[3.575]	[3.359]	[3.110]
dIncome	-3.770***	-3.765***	-4.523***	-2.797***	-3.950***
	[-4.143]	[-4.147]	[-4.941]	[-2.686]	[-3.813]
V(dIncome)	0.264***	0.261***	0.371***	0.139*	0.161*
	[3.070]	[3.070]	[4.292]	[1.646]	[1.922]
Investment	-1.308***	-1.233***	-1.149***	-0.621	-0.353
	[-3.070]	[-3.380]	[-2.680]	[-1.259]	[-0.721]
MktSize	3.155***	3.174***	2.710***	0.470	0.420
	[4.967]	[5.023]	[4.237]	[0.498]	[0.448]
Bond	-0.350***	-0.331***	-0.314**	-0.334**	-0.313**
	[-2.610]	[-2.740]	[-2.330]	[-2.197]	[-2.069]
Tax-Spare	-0.780***	-0.777***	-0.791***	-0.870***	-0.890***
	[-7.100]	[-7.120]	[-7.160]	[-6.540]	[-6.780]
Observations	616	616	616	390	390
F	56.83	67.84	56.11	35.95	31.87
R-squared	0.570	0.594	0.567	0.590	0.561

***, **, and * indicate significant difference from zero at 1%, 5%, and 10% levels for a *t*-test.

***Table 4*. Models estimate (continued)**

The dependent variable in column (f)-(g) is the logarithm of the up-front fees in percentage as it appears on the contract. The dependent variable in columns (h)-(i) is the logarithm of the up-front fees expressed as an equivalent margin above the basis rate. The dependent variable in column (j)-(k) is the share of the up-front payment in the all-in cost that combines up-front fees and interest spread. Exogenous variables are: i is the government currency-and-maturity related monthly average bond yield; Inflation is the yearly month-to-month consumer prices increase; Liquidity is the foreign currencies reserves to short-term debt ratio, p-test (rejection probability) in parentheses; solvency is the ratio of public and publicly guaranteed long-term debt to GNP; dIncome is the last five years GNP-per-capita returns average; V(dIncome) is the variability of income per capita return in the last five years; Investment is the national gross investment to GNP ratio; MktSize is the share of the country private creditors debt relative to all LDC debt; Bond is the share of private creditors debt in the form of bonds; Tax-Spare indicates the presence of a clause exempting from withholding tax.

Regressors	(f)	(g)	(h)	(i)	(j)	(k)
In(l+i)	5.070***	5.360***	0.140	.	0.872	.
	[2.517]	[2.710]	[-0.060]	.	[0.506]	.
Inflation	-0.105	.	0.363***	0.387***	-0.0126	.
	[-0.857]	.	[2.570]	[2.790]	[-0.120]	.
Liquidity	-0.123***	-0.127***	-0.211***	-0.220***	-0.159***	-0.159***
	[3.630]	[-3.910]	[-5.410]	[-5.81]	[-5.500]	[-6.380]
Solvency	0.329	.	0.319	.	-0.200	.
	[1.240]	.	[1.040]	.	[-0.884]	.
dIncome	-6.190***	-6.260***	-4.610***	-5.850***	-0.598	.
	[-3.920]	[-4.180]	[-2.540]	[-3.890]	[-0.444]	.
V(dIncome)	0.414***	0.401***	0.546***	0.536***	0.346***	0.297***
	[3.270]	[3.250]	[3.740]	[3.820]	[3.202]	[3.220]
Investment	1.097*	1.199*	-0.830	.	-0.429	.
	[1.470]	[1.620]	[0.964]	.	[-0.673]	.
MktSize	4.470***	3.222***	-2.575*	-2.880*	-2.700**	-2.490***
	[3.149]	[4.450]	[-1.580]	[-1.870]	[-2.270]	[-5.000]
Bond	-0.413*	-0.432*	-0.036	.	0.249	0.326**
	[-1.800]	[-1.900]	[-.1360]	.	[1.270]	[2.113]
Tax-Spare	-0.512**	-0.498**	-0.716***	-0.723***	0.122	.
	[-2.550]	[-2.510]	[-3.090]	[-3.170]	[0.431]	.
N	390	390	390	390	390	390
F	15.03	23.24	11.20	22.26	6.32	14.11
R-squared	0.359	0.355	0.2948	0.290	0.191	0.2163

***, **, and * indicate significant difference from zero at 1%, 5%, and 10% levels for a *t*-test.

***Table 5*. OLS estimates of up-front fees on other terms of the loan**

The dependent variable in column (a) is the weighted average of the up-front fees in percentage as they appear on the contract. The dependent variable in column (b) is the weighted average of the up-front fees in percentage as an equivalent margin above the basis rate. Exogenous variables are: Spread is the spread above the basis rate; Lifetime is the life length of the loan.

	(a)			(b)		
Regressors	Coeff.	t-Student	p-value	Coeff.	t-Student	p-value
Spread	0.342	7.98	0.000	0.121	6.30	0.000
Lifetime	0.041	4.09	0.000	-0.027	-5.99	0.000
Constant	0.094	1.06	0.288	0.330	8.29	0.000
Observations	435			435		
F	39.40			38.85		
R-squared	0.155			0.153		

***Table 6*. Least-squared estimate of the non-linear model with exogenous split-up of payments**

The endogenous variable is ln(spread) the logarithm of the average spread over the benchmark. Reported exogenous variables are: Inflation is the yearly month-to-month consumer prices increase; Liquidity is the foreign currencies reserves to short-term debt ratio; solvency is the ratio of public and publicly guaranteed long-term debt to GNP; dIncome is the last five years GNP-per-capita returns average; V(dIncome) is the variability of income per capita return in the last five years; Investment is the national gross investment to GNP ratio; MktSize is the share of the country private creditors debt relative to all LDC debt; Bond is the share of private creditors debt in the form of bonds. The coefficient column report the estimated values.

Regressors		Coefficient	St. Dev.	*t*-Statistics	*p*-values
ßo	Constant	0.206	0.198	1.040	0.298
ß1	Inflation	0.509	0.139	3.670	0.000
ß2	Liquidity	-0.075	0.029	-2.560	0.011
ß3	Solvency	0.566	0.263	2.150	0.032
ß4	dIncome	-3.537	1.548	-2.290	0.023
ß5	V(dIncome)	0.793	0.231	3.440	0.001
ß6	Investment	-0.978	0.673	-1.450	0.147
ß7	MktSize	-1.128	1.492	-0.760	0.450
ß8	Bond	-0.113	0.187	-0.600	0.546
N=390	R^2=0.52	F=31.64			

***Table 7*. Descriptive statistics of the eurobonds sample**

Descriptive statistics of the sample of euro-currency floating rate denominated bonds issued by LDCs sovereigns during the period, 1983-1997Variables are: Country is the issuing country; Observations is the number of observations; Spread is the mean value of the spread.

Country	Observations	Spread	Country	Observations	Spread
Argentina	5	2.010	Panama	1	1.000
Brazil	2	1.840	Pakistan	3	2.690
China	11	0.800	Russia	3	0.729
Colombia	2	1.260	South Africa	1	0.250
Czech Republic	1	0.230	South Korea	13	0.249
Ecuador	1	4.750	Sri Lanka	1	1.500
India	3	0.400	Thailand	4	0.125
Malaysia	3	0.100	Turkey	3	1.750
Moldavia	1	2.500	Trinidad & Tobago	1	1.370
Mexico	9	2.190	Venezuela	7	1.860

***Table 8*. Mean difference between interest margins on bank credits and bonds**

Descriptive table of the difference between the first spread designed on syndicated loans and public bonds on a sample of euro-currency floating rate loans issued by LDCs sovereigns during the period, 1983-1997. Variables are: Obs. is the number of observations; Mean is the mean value of the difference; Negative is the number of strictly negative observations (i.e. bank loans charge a lower interest margin).

Window period	All Observations			Observations with an up-front fee		
	Obs.	Mean	Negative	Obs.	Mean	Negative
30 days	6	0.22	0	2	0.188	0
60 days	12	0.22	0	6	0.125	0
90 days	15	0.17	2	8	0.014	2
180 days	23	-0.00	7	15	-0.178	7
360 days	55	0.09	18	41	0.032	16

***Table 9*. Interest spread, lifetime and currency denomination of bank loans and bonds issued within sixty days**

The table reports interest margins and lifetimes designed on all pairs of syndicated loans and public bonds that are launched by one identical LDC sovereign in a window period of 60 days during the period, 1983-1997. Variables are: Bank is the interest spread of the bank loans (percentage); Bond is the interest spread of the bond debt (percentage); Fees is the equivalent additional yearly margin associated with the up-front fees (percentage); Lifetime is the duration in number of years of respectively the bank and the bond loans; Dummies indicate that the currency and/or the basis rate are identical on the bank and the bond debts (1-value).

Pair Number	Interest margins and fees			Lifetime		Dummies	
	Bank	Fees	Bond	Bank	Bond	Currency	Basis
1	0.500	0.260	0.125	8.00	12.00	1	1
2	0.250	0.035	0.188	10.00	10.00	1	1
3	0.250	0.071	0.188	10.00	10.00	1	1
4	1.125	0.152	0.550	2.00	5.00	1	1
5	0.550	0.000	0.350	15.00	3.00	1	1
6	1.750	1.457	1.750	3.00	1.00	1	1
7	1.750	1.457	1.750	3.00	3.00	1	1
8	1.750	1.457	1.750	3.00	2.00	1	1
9	3.000	0.092	0.875	10.00	7.00	1	1
10	5.375	0.000	5.375	2.00	2.00	1	1
11	5.375	0.000	5.375	2.00	2.00	1	1
12	0.375	0.012	0.250	7.00	5.00	0	1
13	1.500	0.298	1.375	7.00	5.25	0	1
14	0.125	0.000	0.062	1.50	20.25	0	1
15	0.625	0.483	0.250	8.00	7.00	0	1
16	0.125	0.078	0.125	10.00	20.00	0	1
17	0.500	0.132	0.375	8.00	15.00	0	1
18	1.250	0.271	0.188	8.00	5.00	0	1
19	0.550	0.000	0.300	15.00	5.00	0	1
20	0.875	0.000	0.150	3.00	4.00	0	1
21	0.875	0.000	0.125	3.00	3.00	0	1
22	0.500	0.000	0.188	10.00	10.00	1	0
23	0.100	0.000	0.375	8.00	15.00	0	0
24	0.100	0.000	0.125	8.00	20.00	0	0
25	0.100	0.000	0.125	8.00	20.00	0	0
26	0.100	0.446	0.250	8.00	7.00	0	0
27	0.780	0.000	0.275	3.00	3.00	0	0

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