

COMMERCIAL BANK LENDING TO DEVELOPING COUNTRIES:

THE QUESTION OF OVERLENDING

by

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Abstract

The developing country debt crisis is believed to have its origin in the lending behavior that predominated during the development of the commercial bank market. This article briefly presents the major characterizations of bank behavior with particular regard to predictions that are empirically testable. A critical comparison of existing empirical studies with these predictions shows that the magnitude of default risk and deposit insurance were incorporated into the lending behavior, but these alone do not explain the evolution of the market. This evolution contradicts a major role for agency problems, but can be understood in terms of information imperfections in the market.

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I. Introduction

Lending by commercial banks to developing countries began to grow rapidly in the late 1960s. The acceleration continued until the onset of the most recent debt crisis in August 1982 with Mexico's non-payment. As a consequence numerous countries, as well as the lender banks, suffered large losses. In a more general sense, the crisis is a chronic one in that countries are still largely unable to repay their debts without severe dislocation, nor are banks able to collect fully on outstanding loans.

The debt crisis has brought attention to a number of theoretical, empirical and policy questions. Economists, policymakers, and researchers have all begun to identify the sources and consequences of the crisis as well as attempting solutions to the problems of the current episode. One particular issue often raised is the type of lending behavior that predominated during the development of the market. Implicit in this concern is the suspicion that countries were lent more than they could reasonably be expected to repay. This phenomenon, which is referred to as "overlending", is portrayed as a consequence of some imperfection in the market. A number of market imperfections, such as deposit insurance and agency problems, have been cited. In this article we review the major alternative characterizations of bank lending behavior and the nature of the market, with emphasis on the empirical implications of these characterizations.¹ We then contrast these implications with the existing evidence in order to arrive at the primary source of the market's expansion.

It should be noted that both the empirical and theoretical work considered here examines the characteristics of the commercial bank lending to developing countries during its pre-crisis expanding state. In Section 2 we present the alternative characterizations of bank behavior during this period. Section 3 contains a discussion of empirical evidence which consists mainly of the spreads charged across countries and the evolution of these spreads for countries as the market developed. Section 4 comments further on the role of experience in this evolution and its relationship with the information imperfections. The final section is a summary of policy implications.

2. The Controversy Over Bank Behavior

In the last decade, international debt economists have transplanted a number of concepts from the new industrial organization literature for the purpose of analyzing debt issues. Using these concepts the lending behavior of banks and the nature of the market have been portrayed in several differing ways: Rational lenders have been portrayed to operate in a perfectly competitive market facing default risk (Eaton and Gersovitz (1981), Cooper and Sachs (1985), Sachs and Cohen (1984)). Or, along with default risk, three distinct imperfections have been considered, termed, for ease of reference, "deposit insurance" (Kareken and Wallace (1978), Penati and Protopapadakis (1988)), "information imperfections" (Kletzer (1984)), and "agency-problem" (Gwynne (1983) Darity (1986)).

In this section we will briefly take each of these characterizations and discuss them. The discussion will answer two questions: First, what are the general empirical implications of the described behavior? Specifically, the implications concerning the behavior of the spread between the

interest rate charged to a country and the London Interbank Borrowing Rate (LIBOR) is discussed. Second, the question is asked: could the described behavior lead to overlending?

A. Default Risk

Lenders can be portrayed as rational agents operating in competitive markets. It has been shown that introduction of default risk to this environment will have a significant impact on the loan contracts. Quantity rationing of loans and shortening of the maturity structure of lending are among the most well known consequences (Eaton and Gersovitz (1981), Sachs and Cohen (1984)). However, in the absence of other market imperfections, default risk alone does not, of course, result in overlending.

The presence of default risk influences the spreads charged on Eurocurrency loans. It has been postulated that the spreads reflect the probability of default of a particular country (see Feder and Just (1977), Eaton and Gersovitz (1981), Sachs (1981); and see Eaton and Taylor (1986) for a review of others) in the following manner:

$$s = [p/(1-p)] \theta \quad (1)$$

where s = spread over LIBOR for a country at a particular period (for notational convenience subscripts are not used here),

θ = other variables affecting s ,

p = probability of default.

This relationship can easily be justified assuming that the banks operate in competitive markets and are risk neutral.²

B. Deposit Insurance

The impact of current FDIC deposit insurance practices on banks' pricing of risks has been analyzed (Kareken and Wallace (1978), Kareken (1986),

Penati and Protopapadakis (1988)). The FDIC explicitly insures bank deposits below a certain size at fixed premium that is unrelated to the nature of the insured risk. In addition, an FDIC practice is to protect contractually uninsured depositors if the size of the bank that fails is large enough to raise concerns about the financial system³. In either case the banks would expect not to bear all the risks associated with foreign loans⁴. It has, in fact, been demonstrated that deposit insurance (implicit or explicit) tends to subsidize risky loans. This can explain banks' overlending to developing countries as well as their underpricing of these loans.

C. Imperfect Information

The poor quality of information on particular countries was an important feature of the market for developing country lending until the debt crisis. Commercial banks, investors, and even the borrowers themselves have suffered from a lack of data on the volume and nature of developing country loans. Zaire is given as a classic example since it had to send questionnaires to its creditors in order to find out how much it owed (Gluck 1984, pp. 23, 24). It is, therefore, reasonable to assume that in making loans each bank did not know the total amount lent to a country by other lenders. Kletzer (1984) has incorporated this information structure in a model of competitive lending. He shows that, if an equilibrium exists with a positive level of debt, both the spreads and the level of debt are above the quantities that would prevail in the absence of such an imperfection. This inefficiency arises because lenders are unable to restrict the quantity of loans provided to each borrower at a given interest rate. Each lender is assumed to extend only an insignificant portion of the borrowers demand for credit. The full effect on the probability of debt repayment of an increase in the amount he lends is not internalized by an individual lender. It is

therefore plausible that high spreads and overlending are consistent.

The attributes of borrowers, however, can be learned by directly investing in information⁵. Assuming that gathering this information has high initial costs (and long term debt contracts do not exist), the spreads charged are initially higher than the spreads in the absence of such costs. The incremental information required as experience with a borrower accumulates, however, is likely to be reduced. This would lead the spreads to decline towards the spreads that would prevail in the absence of such costs. Another way of viewing this is that the decline of the spreads are a consequence of risk averse-lenders. As the experience with the borrower accumulates, and the lenders' uncertainty about the borrower declines, the spreads that were initially high because of high uncertainty discounts would decline towards the rates that would prevail in the absence of such uncertainty.

D. Agency Problem

This view presents the overexpansion of lending to developing countries primarily as a consequence of an agency problem between senior bank managers and their junior loan officers (see Darity (1986) for a discussion). The argument made is that junior loan officers are rewarded by the volume of loans contracted⁶. Junior officers who succeed by making as many loans as possible, must, however, make loans that meet the approval of their managers. To make the loans appear prudent to the managers, junior officers could package all sorts of guarantees from sources in the borrower's country. The worth of guarantees, of course, would vary across institutions and countries that provide them, about which the junior officers are likely to be more informed than their managers. Also the managers' ability to give the proper incentives to avoid bad loans might be limited. As a consequence, in the early stages of lending to new countries, loans made by junior

officers would be at rates that were too low in view of the risk involved, leading to overlending. (In the presence of credit rationing, agency problems would imply that even the borrowers that should be credit constrained get access to the market.) Experience with a borrower might then enable the managers to learn the worth of various guarantees, leading to better incentive contracts for the loan officers. In such cases the spreads will increase with experience to reflect the underlying risks.

Overall then, the various prominent characterizations of bank lending behavior have distinct implications for the spreads as the market developed. First, in situations in which only default risk is present, the spreads reflect the risk characteristics of the borrower, but are independent of the level of experience with a particular borrower. Second, introduction of deposit insurance decreases the spread, but the spreads continue to be independent of experience. Third, lenders may know little about the attributes of the new borrowers, implying that the spreads will be high initially, but decline through repeated experience with the borrower. Fourth, the agency argument implies that spreads will be too low in view of the risks involved but repeated borrowings could lead the spreads to increase if managers learn to provide better incentive contracts for each borrower.

3. Empirical Evidence

Systematic empirical studies that evaluate the characterizations discussed above are still somewhat limited. The existing evidence, however, provides support for some characterizations over the others. The relationship between actual spreads and a number of economic characteristics of the borrowers, which are postulated to measure default risk, has been fully investigated (Feder and Just (1977) and Edwards (1984)). The debt-service

ratio, imports to GNP ratio, imports to reserves ratio, GNP growth, and investment to GNP ratios are among the variables that are found to have significant impact on spreads. In addition Özler (1988b) demonstrates that borrowers that had bad repayment histories in an earlier era paid higher spreads. These findings provide evidence that in making loans to developing countries, the banks have taken some characteristics of the borrowers into account, which in turn indicates that default risk was considered.

Existing empirical evidence that investigates the impact of deposit insurance is limited and is not based on a direct investigation of the relation between spreads and banks' expectations. James (1988) provides two empirical tests of the implicit insurance hypothesis. First, the relation between the rate paid on large CDs and measures of foreign exposure is investigated. If large CDs are implicitly insured against losses from defaults on foreign loans, then, foreign exposure should not affect the rate paid on CDs. The second test is an examination of the relation between bank common stock returns and changes in the market value of developing country loans (in the secondary market). Extension of full implicit guarantees to bank shareholders implies that no relation is expected between the return on bank equity and the return on developing country loans traded in the secondary markets. The results suggest that bank deposits have received full implicit insurance but the stockholders have not.

Özler (1988a) focuses on the two characterizations that rely on imperfect information and agency-problems by examining the evolution of spreads charged to a country as a function of their prior experience commercial banks had with that country. By showing that spreads tend to decline with repeated experience Özler demonstrates that explanations based on imperfect information by lenders about the borrower are important in the

analysis of the expansion of the market . Explanations based on agency problems in the banking firm as the primary source of expansion are eliminated since they imply the opposite evolution. Next, we consider in more detail this picture of the evolution of the commercial bank lending market.

4. Relevance of Experience for Spread Determination

As described above, the information imperfection has two important characteristics for our discussion: (i) It manifests itself in spreads which decline as commercial banks engage in repeated lendings to that country; and (ii) it leads to the kind of overlending behavior that contributed to the onset of the crisis. In order to determine the magnitude of this behavior Özler (1988a) investigated how repeated experience of a borrower in the Eurocurrency market has affected the spreads charged. For this purpose information on over 2000 Eurodollar loans with LIBOR base rate for 55 countries was investigated. In this investigation experience is measured in a number of ways, constrained by the fact that only the month, size, and the specific borrower are known for each loan. For example, one measure of experience is the cumulative number of months in which the borrower received a loan.⁷

The evolution of spreads with experience is displayed in Figure 1. The spreads are constructed from the actual spreads, first, by normalizing the actual spreads of each country to the mean of all spreads of that country. Second, at each level of experience the average of normalized spreads across countries is calculated. Finally, these averages are smoothed by three-point smoothing to aid visualization.

In this figure, two patterns are immediately noticeable. First, the spreads at low levels of experience are higher than average (unity), and as experience increases they decline. Second, and of lesser significance here, there is evidence of cyclical behavior. This is found to be a remnant of cyclical behavior of spreads in calendar time, associated with macro events such as the oil shocks and industrial country recessions and is highly damped in Figure 1, because countries have different dates of entry to the market.

In order to gain a more quantitative description of this evolution, experience is introduced to a model that is similar to the one defined with equation (1). There are a number of ways in which experience can be incorporated into the model (for more details see Ozler(1988a). A specification that could easily lend itself to the testing of alternative bank behavior is presented here. Two criteria are important in the choice of the functional form. First, as experience increases to high levels the spreads should come to reflect the spreads predicted by model (1). Implicit in this restriction is that after enough experience the learning process is complete. In the context of the information imperfection, this means that the banks fully discover the attributes of the borrowers, whereas in the context of agency problems it means that the managers learn to provide better incentive contracts. Second, spreads at low levels of experience should be allowed to be lower or higher than the spreads predicted by model (1). A simple one-parameter function that easily satisfies these two criteria is the general hyperbolic form.⁸ Hence model (1) can be modified as:⁹

$$s = \frac{p}{(1-p)} \theta \left(1 + \frac{1}{X}\right)^{\gamma} \quad (2)$$

where X = experience.

In this model $\gamma = 0$ indicates that experience does not contribute to the behavior of the spreads. $\gamma > 0$ indicates that at low levels of experience with a borrower, spreads are higher than the predicted rates by model (1) while $\gamma < 0$ indicates the opposite.

The primary finding of this study is that experience variables have significant impact on the spreads: Spreads start at high values at low levels of experience and decrease to those predicted by model (1) as experience increases (i.e., in form like (2) this would be indicated with a positive value of γ). In particular it was found that at initial experience levels spreads are 20-40 percent above the asymptotic spreads. The impact of experience becomes negligible when experience reaches 30-40 prior loans.

Overall, the findings support the explanations based on information problems. The evidence eliminates the explanations based on the agency problems as the primary source of the expansion of the market, though agency problems may have played a role. This empirical investigation does not provide direct evidence for existence of overlending. It does, however, demonstrate the existence of a significant information imperfection which has been shown by Kletzer to cause overlending. The findings summarized here, thus, are consistent with the overlending hypothesis.

5. Conclusions

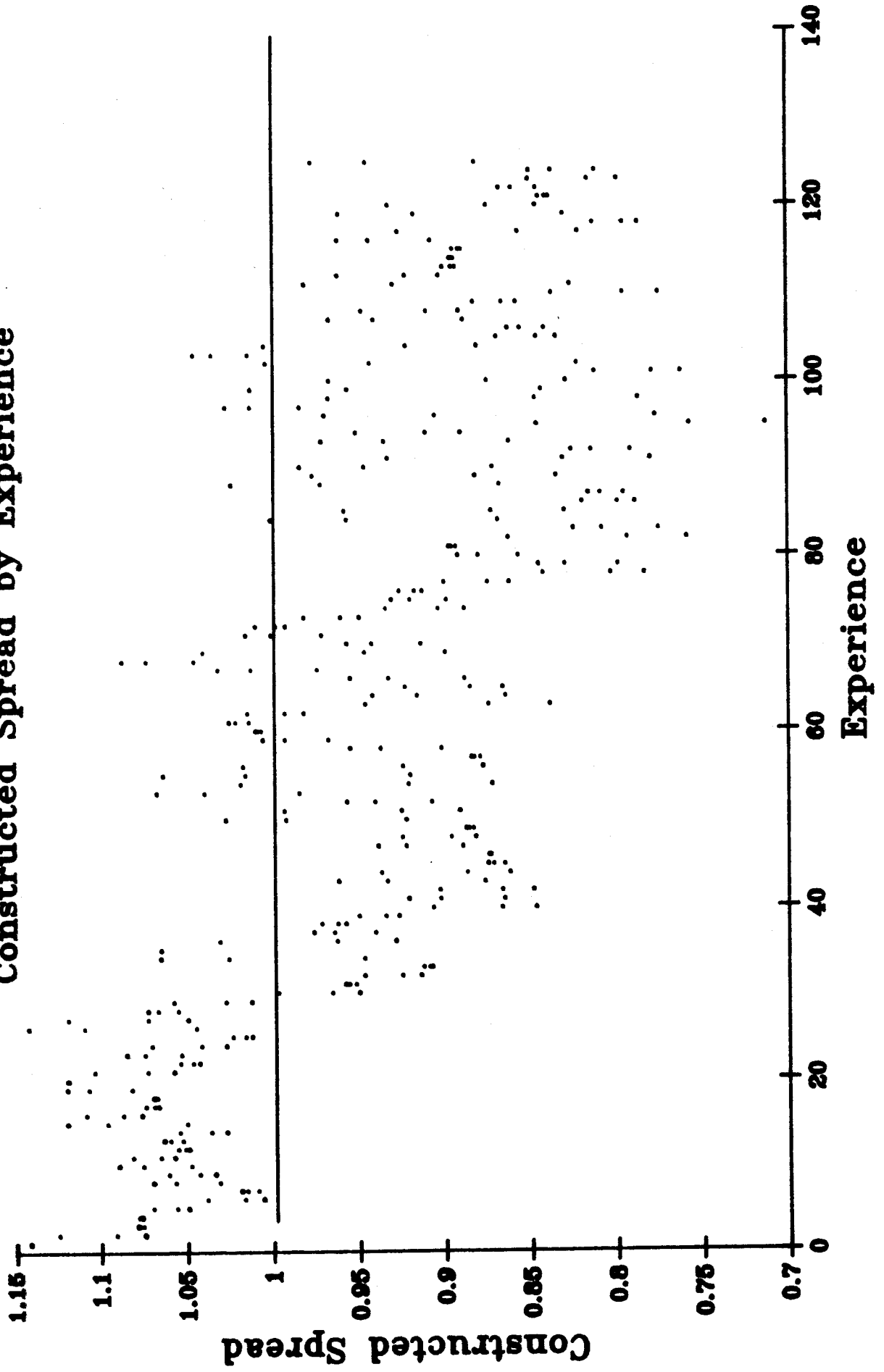
The lending behavior of commercial banks and the nature of the market of developing country loans have been portrayed in a number of different ways. These include characterizations based on default risk, deposit insurance, imperfect information and agency problems. Existing empirical evidence indicates that default risk characteristics of countries had an

impact on the spreads they were charged. Evidence is also consistent with deposit insurance. Agency problems as a primary source of the expansion of the market, however, are refuted in favor of the arguments based on imperfect information.

The finding that informational imperfections have been dominant in creating distortions in the loan market has important policy implications. In particular, it provides support for the policy recommendations that suggest that banks should provide more accurate information on the level of their lending to countries. Furthermore, the international agencies should provide more assistance to the lenders and the borrowers in compiling and disseminating information. Some of these policies have already been implemented since the onset of the crisis.

The lack of evidence that the agency problem in the banks dominated the expansion of the market is also important. The implication of this finding is that in the search for remedies for the crisis, regulations concerning the internal structure of the banks are not empirically justified on the basis of agency problems.

Constructed Spread by Experience



FOOTNOTES

*This paper was presented at the 1988 WEA meetings in a session entitled: The Political Economy of LDC Debt Repayment.

¹For a broader review of issues in international debt see Eaton , Gersovitz and Stiglitz (1986), and Eaton and Taylor (1986). Darity (1986) discusses issues relevant to overlending in the context of loan pushing hypothesis. Also see Guttentag and Herring (1985) for a discussion of bank behavior in the context of overlending.

²To illustrate this assume that loans are for one period, and default means complete loss of both the principal and the interest rate. Let $s = i - i^*$ where i^* is the LIBOR rate and i is the interest rate charged to a country. Then the equilibrium condition is $(1-p)(1+i) = (1+i^*)$, which implies that $\theta = (1+i^*)$. This structure has been implemented by Edwards (1984). Introduction of more realistic assumptions yield a similar structure, for example see Feder and Just (1977).

³See Boskin et.all. (1987) for a more complete discussion of federal insurance programs.

⁴It is also argued that banks may have expected to receive official international support from IMF funds for debtor countries to protect them from the impact of defaults (Guttentag and Herring (1985)).

⁵Lenders can of course learn about borrowers partially by inferences from their repayment history. Initial high spreads which are the consequences of imperfect information, could show a declining behavior as the borrowers gain "reputation" for being good borrowers (see Diamond (1986)).

⁶An explanation of the existence of volume contracts is in Fershtman and Judd (1987).

⁷Countries in the sample have widely varying entry dates. For example Chile appears in the beginning of the sample period (Oct. 1968), whereas Zimbabwe appears only in November 1980.

⁸Another advantage of this form is that it easily lends itself to linear estimations. In empirical implementation of models similar to (1) probabilities are assumed to have a logistic form. This permits the logarithm of spreads to be directly expressed in terms of economic characteristics of borrowers as well as permitting equation (2) to be estimated linearly.

⁹In implementing this model empirically economic characteristics of the borrowers similar to the ones employed in Feder and Just (1977) and Edwards (1984) are used. In addition other variables such as the size of the Euro-currency market are employed to control for the variation of spreads over time.

References

- Boskin, M., B. Barham, K. Cone, and S. Ozler, "The Federal Budget and Federal Insurance Programs," in Boskin M. (ed.) Modern Developments in Public Finance, Basil Blackwell 1987.
- Cooper, R. and J. Sachs, "Borrowing Abroad: The Debtors Perspective," in Smith G., J. Cuddington (eds.) International Debt and Developing Countries, Washington, DC, World Bank, 1985, 21-60.
- Darity, W., "Did Commercial Banks Push Loans on the LDC's?" in M.P. Clauden (ed), World Debt Crisis, Ballinger Publishing, 1986.
- Devlin, R., "The Structure and Performance of International Banking During the 1970s and its Impact on the Crisis of Latin America," Kellogg Institute, Working Paper #90, January 1987.
- Diamond, D. W. "Reputation Acquisition in Debt Markets," CRSP Working Paper 134, The University of Chicago, 1986.
- Eaton, J. and M. Gersovitz, "Debt with Potential Repudiation: Theoretical and Empirical Analysis," Review of Economic Studies, April 1981, 48, 289-309.
- _____ and J. Stiglitz, "The pure Theory of Country Risk" European Economic Review, June 1986, 22, 209-265.
- Eaton J. and L. Taylor, "Developing Country Finance and Debt," Journal of Development Economics, June 1986, 22, 209-265.
- Edwards, S., "LDC's Foreign Borrowing and Default Risk: An Empirical Investigation 1976-1980," American Economic Review, September 1984, 74, 726-734.
- Feder, G. and R. Just, "A Study of Debt-Servicing Capacity Applying Logit Analysis," Journal of Development Economics, March 1977, 4, 25-38.
- _____ and _____, "An Analysis of Credit Terms in the Eurodollar Market," European Economic Review, May 1977, 9, 221-243.
- _____ and K. Ross, "Risk Assessments and Risk Premiums in the Eurodollar Market," Journal of Finance, June 1982, 37, 679-692.
- Fershtman C. and K. Judd, "Equilibrium Incentives in Oligopoly," American Economic Review, 77, 927-40, 1987.
- Guttentag, J. and R. Herring, "Commercial Bank Lending to Developing Countries: From Overlending to Underlending to Structural Reform," in G. Smith, J. Cuddington (eds.) International Debt and Developing Countries, Washington, DC: World Bank, 1985, 129-150.

- Gwynne, S.C. "Adventures of the Loan Trade", Harper's, September 1983, 22-26.
- James, C. "Empirical Evidence on Implicit Government Guarantees of Bank Foreign Exposure", University of Oregon mimeo, December 1977.
- Kareken, J., "Federal Bank Regulatory Policy: A Description and Some Observations," Journal of Business, 1986, 59, 3-48.
- Kareken, J., and N. Wallace, "Deposit Insurance and Bank Regulation: A Partial Equilibrium Exposition," Journal of Business, 1978, 51, 413-438.
- Kletzer, K., "Asymmetries of Information and LDC Borrowing with Sovereign Risk", Economic Journal, 1984, 287-307.
- McDonald, D., "Debt Capacity and Developing Country Borrowing," IMF Staff Paper No. 29, December 1982, 29, 603-46.
- Ozler, S., "Evolution of Commercial Bank Lending to Developing Countries," UCLA mimeo, July 1988a.
- _____, "Have Commercial Banks Ignored History?" UCLA mimeo, July 1988b.
- Penati A. and, A. Protopapadakis, "The effect of Implicit Deposit Insurance on Banks' Portfolio Choices with an Application to International "Overexposure", " Journal of Monetary Economics 21, 1988, 107-126.
- Sachs, J. and Cohen, D., "LDC Borrowing with Default Risk," Kredit und Kapital, forthcoming.
- _____, "The Current Account and Macroeconomic Adjustment in the 1970s," Brookings Papers on Economic Activity, 1:1981, 201-68.