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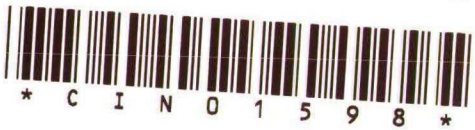

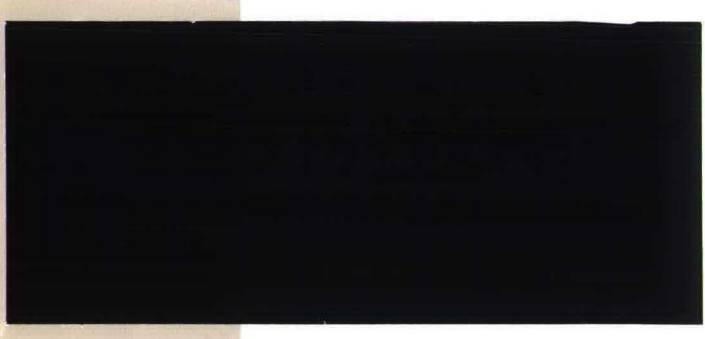

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THE INCIDENCE OF INTEREST WITHHOLDING TAXES: EVIDENCE FROM THE LDC LOAN MARKET

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THE INCIDENCE OF INTEREST WITHHOLDING TAXES: EVIDENCE FROM THE LDC LOAN MARKET

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Abstract:

During the 1970s, developing countries differed widely in their regimes of nonresident interest withholding taxes. This paper provides evidence on the relationship between interest rates paid by private LDC borrowers on international credits and the withholding tax regime. Pre-tax interest rates are estimated to have increased significantly with withholding tax rates. The extent of the mark-up of withholding taxes into higher pre-tax interest rates reflects the offsetting foreign tax credits that banks expect to receive. These expected tax credits represent the incidence of the nonresident withholding taxes on creditor country treasuries. Estimated expected tax credits, as reflected in bank interest rates, vary with the year of loan origination and they are relatively large for short term loans.

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1. *Introduction*

In an open economy, taxes on the return to capital are potentially in part exported in the sense that they are borne by nonresidents. A country's ability to export its capital income taxes is related importantly to its market power in the international capital market. Correspondingly, Goulder (1990) argues that the welfare gains for the United States following a reintroduction of a 30 per cent nonresident withholding tax on portfolio interest depend on the substitutability between U.S. and non-U.S. assets. In this regard, foreign tax credits that international investors may receive to offset foreign capital income taxes are also important. To illustrate, Damus, Hobson and Thirsk (1991) focus on how the U.S. foreign tax credit regime affects Canada's ability to export part of its corporate income tax. They show that the welfare gains for Canada following an increase in the corporate income tax are far greater, if U.S. investors can receive offsetting foreign tax credits from the U.S. Treasury.

While foreign tax credits clearly affect the international incidence of capital income taxes, little systematic evidence exists about their significance to international investors in practice. We can obtain such evidence, however, by observing how pre-tax returns on international financial assets are affected by the tax regime in the capital-importing countries. In this vein, this paper examines how pre-tax interest rates on private international loans are affected by interest withholding taxes imposed by the borrowing countries. The paper specifically examines international bank loans to private borrowers in developing countries originated during the pre-international debt crisis period of 1971 to 1981.[1]

Source country withholding tax rates typically vary with the residence and status of the interest payor. Countries, for instance, tend to exempt interest on the public debt from nonresident withholding taxation and they may exempt bank interest.[2] If withholding taxes are not avoided or evaded, then the foreign tax credit regime in the lender's state of residence can be expected to be a main determinant of pre-tax interest rates. Absent income effects and international capital market power on the part of the borrowing country, pre-tax interest rates rise by the full withholding tax liability, if there are no foreign tax credits available at all. In this instance, the withholding tax is borne entirely by the private borrower. At the other extreme, pre-tax interest rates do not reflect withholding tax rates, if fully offsetting foreign tax credits are available. In this case, the withhol-

ding tax is wholly borne by the treasury of the creditor's state of residence.

The evidence in this paper suggests that the mark-up of withholding taxes into higher pre-tax interest rates in the LDC loan market has only been partial. The incidence of interest withholding taxes thus has been shared by the LDC private borrowers and the creditor country treasuries. As the incidence is partly shifted towards the creditor country treasury, the debtor country overall benefits from withholding taxes by way of lower net-of-tax international interest rates. Withholding taxes, however, are estimated to increase pre-tax interest rates, which suggests that they hamper international capital flows. The estimated rate of mark-up is smallest during the high lending year of 1977. At the same time, the estimated mark-up is smaller for loans with a maturity of 3 or fewer years than for longer term loans.

The evidence presented in this paper necessarily relates to a particular international credit market and a particular period in time. The mark-up in the LDC bank loan market may be only partial, because commercial banks are generally subject to national corporate income taxation. Banks in principle, therefore, can obtain foreign tax credits. In financial markets dominated by tax-exempt institutions, the mark-up may well be larger. Commercial banks generally also are required by their national authorities to prepare consolidated income statements, which makes the underreporting of foreign source interest income by banks more difficult. Withholding taxes on bank interest, therefore, may not be significant in reducing the tax evasion of foreign source interest income. In this regard, withholding taxes may be more important in preventing the tax evasion by private individuals. The evidence in this paper is also special, as it relates to the period preceding the 1986 U.S. tax reform that significantly restricted the creditability of foreign interest withholding taxes.

Several studies have previously examined the determination of interest rates in the international loan market. Feder and Ross [1982], for instance, relate interest rates on Eurodollar loans to subjective country risk assessments. Feder and Just [1977], Edwards [1984], and Özler [1993] further examine how LDC loan spreads reflect various macroeconomic country risk indicators and earlier payments difficulties, if any. These studies have ignored the relationship between earlier withholding tax regime and lending rates. For the case of Germany, Nöhrbass and Raab [1990], however, show that the yield on Deutschmark bonds fully reflects the 10 per cent

withholding tax in force in early 1989.[3] Frankel [1984, 1985] offers an early analysis of the role of the nonresident withholding taxes in banks' overall asset allocation choice and in the pricing of loans.

The remainder of this paper is organized as follows. Section 2 focuses on the bank's international loan pricing problem. Competitive bank interest rates reflect the tax treatment of interest by the lending and borrowing countries and the borrowers' overall creditworthiness. Of particular significance are the foreign tax credits a bank expects to receive. The share of the withholding tax borne by the creditor country treasury is a parameter in the loan pricing relationship, and in the resulting estimating equation. Section 3 discusses the data used in this study, and it presents the empirical results. Section 4 concludes the paper.

2. *The international loan pricing problem*

International loan contracts can specify a net-of-withholding tax interest rate to be received by the creditor, or they can specify a pre-tax, gross interest rate to be paid by the borrower. Banks generally prefer to write contracts that specify net interest rates, as they wish their net-of-withholding interest receipts to be independent of changes in the withholding tax regime. At present, the creditability of foreign interest withholding taxes in the United States does not depend on the type of loan contract. U.S. banks, therefore, overwhelmingly write international loan contracts that specify a net interest rates. Until the mid 1970s, however, the Internal Revenue Service (IRS) in the U.S. disallowed U.S. banks foreign tax credits for withholding taxes paid on net loans, as the withholding taxes were argued to be paid by the borrower and not by the U.S. bank.[4] At that time, U.S. banks, therefore, had a tax incentive to write loans specifying gross interest rates. This section examines a bank's international loan pricing problem. In setting interest rates, a bank takes into account taxation as well as credit risk associated with the borrower country and individual loan characteristics.

Let i be the net interest rate, and let τ_w be the withholding tax rate levied by the borrowing country. The gross interest rate, i_g, simply equals $i/(1-\tau_w)$, while the tax withheld per dollar of principal is $i\tau_w/(1-\tau_w)$. Let i^* be the bank's cost of funds, and let τ_c be the marginal

corporate income tax rate applied to the bank's foreign source interest income. The tax rates τ_c and τ_w are non-negative and less than unity. The bank can deduct its cost of funds from its foreign source taxable income. In principle, foreign interest withholding taxes are creditable against the bank's home country income taxes.[5] If actual foreign source taxes exceed the foreign credit limitation, however, the bank is in an excess credit position. In the U.S., the foreign tax credit limitation is the (pre-credit) U.S. tax liability on the foreign source income.

Nonresident interest withholding taxes typically are in the range from 0 to 30 per cent, while corporate tax rates in the major creditor countries exceed 30 per cent. This suggests that banks will never be in an excess credit position. This reasoning is not correct, however, as creditor and borrower country definitions of the income tax base tend to differ. The debtor country, in particular, imposes withholding taxes on gross interest income, while the creditor country taxes the bank's interest income net of interest and other expenses.[6]

In practice, a bank cannot perfectly foresee at the time of loan origination whether the potential tax credits associated with a particular loan will be realized ex post. This uncertainty reflects that a bank's other, generally uncertain, foreign source income and expenses also may affect the foreign tax credits that are allowed. Formally, let α be the probability that a bank will be able to realize the potential foreign tax credits associated with a marginal loan. If so, the bank's marginal tax rate on foreign source interest income, τ_c, is positive. With probablity $1 - \alpha$, the bank instead is in an excess credit position. In that instance, the bank pays no income tax in the creditor nation on its foreign source income, and the marginal, post-credit corporate income tax rate is zero.

In setting interest rates, banks also take into account default risk. Let p be the probability of loan default. For simplicity, we assume that the bank does not receive any interest or principal repayment in case of default. The bank's home country tax authority is assumed to provide a full loss offset against the corporate income tax in case of loan default (unless the bank pays no income tax on foreign source income). Banks are assumed to be risk neutral, and bank competition ensures that a bank's expected after-tax profits from a marginal loan are zero.[7] This gives rise to the following pricing relationship for a single period, unit-value loan,

$$1 + \alpha i^*(1 - \tau_c) + (1 - \alpha) i^* =$$

$$\alpha \left[(1-p)[1 + i + \frac{\tau_w}{1 - \tau_w} i - \frac{\tau_c}{1 - \tau_w} i] + \tau_c p \right] + (1 - \alpha)(1 - p)(1 + i) \qquad (1)$$

The left hand side of (1) represents the expected net-of-tax principal and interest expense of a unit-value loan. The expression reflects that with probability α the bank will have taxable foreign source income from which to deduct its cost of funds, i^*. The two terms on the right hand side of (1) are the net-of-tax proceeds of the loan for the cases where the bank can and cannot realize its marginal foreign tax credits. In the first instance, which occurs with probabiblity α, the bank receives a principal repayment (equal to 1), the net-of-withholding tax interest payment (equal to i), and the foreign tax credit (equal to $[\tau_w/(1 - \tau_w)]i$), while it pays corporate income tax on the gross interest receipt (equal to $[\tau_c/(1 - \tau_w)]i$), all in case of loan repayment. In case of default, the bank instead receives the after-tax value of the tax loss offset (equal to $\tau_c p$). In the excess credit case, which occurs with probability $1 - \alpha$, the bank obtains no foreign tax credit and the bank's marginal corporate, post-credit income tax rate is set to zero.

After dividing (1) by $1 - \alpha\tau_c$ and rearranging, we obtain,

$$1 + i^* = (1 - p)[1 + i(1 + \beta \frac{\tau_w}{1 - \tau_w})] \qquad (2)$$

where,

$$\beta = \alpha \frac{1 - \tau_c}{1 - \alpha \tau_c}$$

The parameter β indicates how much the net interest payment, i, flowing from the country is reduced, if the withholding tax payment, equal to $[\tau_w/(1 - \tau_w)]i$, to the country is increased by unity for given values of i^* and p. The parameter β, which satifies $0 \leq \beta \leq 1$, thus is naturally interpreted as the share of withholding tax borne by the creditor country treasury, while $1 - \beta$ is the share of the withholding tax borne by the private borrower. The incidence parameter,

β, increases with the probability, α, that the potential credit is realized. A higher value of α can be interpreted as a more generous foreign tax credit regime, and this naturally increases the share of the nonresident withholding tax borne by the creditor country treasury. The expression for β also reveals that it declines with the corporate income tax rate, τ_c, if $0 < \alpha < 1$. To see why, note that a higher withholding tax rate leads to a higher pre-tax interest rate. This leads to an increase in the bank's expected corporate tax bill, as it is the bank's pre-tax foreign source interest income that is subject to corporate income taxation. The pre-tax and thus the net interest rates have to rise sufficiently to offset the rise in the bank's corporate tax liability.

The probability of loan default, p, is assumed to reflect country as well as on loan characteristics.[8] Country variables that have previously been considered good indicators of credit risk include the country's debt service to exports ratio, and the debt to GNP ratio. Loan specific variables that can influence the probability of default are loan size and maturity. Default probabilities are also expected to be positively related to the gross interest rate, i_g, as the gross interest rate represents the withholding tax-inclusive interest expense to the private borrower.[9] The probability of default, p, is assumed to have the following functional form,

$$p = \frac{i_g \sum_{i=1}^{n} \gamma_i x_i}{1 + i_g \sum_{i=1}^{n} \gamma_i x_i} \tag{3}$$

where the x_i are risk factors other than the gross interest rate, i_g, and where the γ_i are parameters.

After inserting (3) into (2), we obtain the following expression,

$$S = \sum_{i=1}^{n} \gamma_i (1 + i^*) x_i - \beta \tau_w \tag{4}$$

where,

$$S = (1 - \tau_w)\left(\frac{i - i^*}{i}\right)$$

The sign of the relationship between the net interest rate, i, and the withholding tax rate, τ_w, implicit in (4) is in principle ambiguous. This is because a higher withholding tax rate increases the risk of default and thus the risk premium reflected in the net interest rate, if it increases the gross interest rate. A higher tax rate, on the other hand, enlarges potential tax credits for a given net interest rate, which tends to reduce the required net rate of interest. Using (4), we can find that,

$$\frac{di}{d\tau_w} = \frac{i}{1 - \tau_w} \cdot \frac{i}{i^*} \left[\frac{i - i^*}{i} - \beta \right] \tag{5}$$

Hence, we see that $di/d\tau_w > 0$, if $(i - i^*)/i > \beta$ and vice versa. A higher withholding tax rate, τ_w, thus leads to a higher net interest rate, i, if the incidence parameter, β, is relatively small.

Equation (4) is the basis for the estimation below. To account for possible measurement error, we add a stochastic term to (4) that is assumed to consist of a region specific component v_r, a time specific component w_t and a transaction specific random component ϵ_j for transaction j. Three borrower regions are distinguished: Africa, Asia, and Latin America[10]. The resulting estimating equation is as follows,

$$S_j = \sum_{i=1}^{n} \gamma_i (1 + i_t^*) x_{ij} - \beta(\tau_w)_j + v_r + w_t + \epsilon_j \tag{6}$$

The error components v_r, w_t and ϵ_j are assumed to have zero means and covariances and variances σ_r^2, σ_w^2 and σ_ϵ^2, respectively.

3. *The data and empirical results*

The data set consists of 510 individual loans contracted during the pre-debt crisis period of 1971-1981. The data source is the World Bank's Debtor Reporting System that covers loans reported by national authorities. All loans in the sample are to private debtors to ensure that the loans are not exempted from withholding taxation. The loan amounts are denominated in U.S.

dollars and interest rates are set as fixed spreads above the London Interbank Offer Rate (LIBOR). For each loan, the month of origination, the month of maturity, the loan amount, the debtor country, and the creditor country are known. On a loan by loan basis, the relevant bilateral interest withholding tax rates were collected reflecting the tax treaties between debtor and credit nations (see the Appendix for data sources). Syndicated, multiple creditor country loans are included in the sample only if the debtor country imposes a uniform withholding tax rate on all outgoing interest payments.

Table 1 breaks down the loans by the 14 countries of residence of the private borrowers in the data set. There is some evidence that borrowers in high withholding tax countries paid relatively low interest spreads. Among the major borrower countries, Korea and Mexico imposed relatively high average withholding tax rates of around 21 per cent. Borrowers in these countries contracted relatively low average spreads of 1.20 and 0.98 per cent. Borrowers in Chile, Costa Rica and Honduras, with lower than average withholding tax rates, instead contracted higher than average spreads.

Next, we will discuss the results of regressions based on equation (6). As in (6), the non-tax rate regressors are the x_i risk variables multipled by $1 + i^*$. The results are reported in Table 2. The regression reported in the first column is for the entire sample of 510 loans contracted during the period 1971-1981. The estimate of the β parameter is 0.123, which suggests that the share of the incidence of nonresident withholding taxes on the creditor country treasury is about one eighth. As expected, the investment to GNP ratio enters the regression negatively, while the debt to GNP ratio enters positively. The coefficient for the maturity variable is estimated to be negative.[11] As discussed, U.S. banks could not obtain foreign tax credits for nonresident interest withholding taxes in the early 1970s, unless the loan contract specified the pre-tax, gross interest rate to be paid to the lender. To reflect the later change in IRS practice, we report a separate regression for only the period 1975-1981 in the second column of the table. The estimate of β is now somewhat larger at 0.164. This estimate is slightly above the average of of the variable $(i - i^*)/i$, equal to 0.151 for the loans in this restricted sample. This suggests from (5) that higher withholding taxes have led to somewhat lower net interest rates on average.

The value of potential foreign tax credits associated with withholding taxes can be

expected to vary with time, as banks' ability to realize these credits also changes over time. Second, the value of potential foreign tax credits should vary with the state of residence of the creditor, as the generosity of tax credit provisions varies with the creditor nation. The value of the parameter β, therefore, is also expected to vary with time and with creditor nationality. To check this, regressions reported in Table 3 allow for time and creditor specific estimates of β. The sample is restricted to the years 1975-1981. For the regression reported in column 1, the estimates of β only vary with the year of loan orgination. The estimates of β are positive for all years, but they are only significant for the years 1975-1978. The estimate of β is highest at 0.366 for the year 1977. This year was a peak lending year, with 87 loans originations of the 510 in the sample. A regression that also breaks down the β's by creditor nationality, in particular allowing for separate β's for the U.S. and the U.K., is reported in the second colum of the table. The estimates of β move together closely through time for the three creditor categories. The similarity of β estimates across creditor categories suggests that bank competition has led banks worldwide to price loans very similarly. Again, the estimates of β become insignificant starting in 1979.

The insignificance of the estimates of β during the years 1979-1981 is rather striking. Apparently, banks placed little value on additional potential foreign tax credits at the end of the 1970s. A possible reason for this finding is that banks realized that they already had contracted sufficient international loans to shelter their taxable income. Alternatively, banks had adequate other means of sheltering taxable income. Finally, the second oil shock of 1979 may have reduced bank profitability sufficiently to obviate a great need for tax shelters in the early 1980s.

To examine the potential role of bank profitability, Table 4 reports the income taxes paid by U.S. banks as a percentage of gross before-tax income. Separate measures are reported for all banks traded on the New York Stock Exchange (NYSE) and for the 10 top banks. These tax burden measures reached lows of 24.45 and 29.86 for the two categories of U.S. banks in 1981. This suggests that the low tax liabilities of U.S. banks around 1981 may have contributed to the weaker pass through of potential tax credits into lower interest rates to LDC borrowers.

Interestingly, the lower estimates of β for the period 1979-1981 just preceded the onset of the third world debt crisis in August 1982, when Mexico declared its unability to service its foreign debt. The reduced valuation by U.S. and other banks of potential foreign tax credits

before 1982 could have been a contributing factor in the timing of the beginning of the debt crisis, even if an eventual debt crisis was inevitable. The reduction of foreign tax credits by U.S. banks was particularly unfavorable to the developing countries, as it coincided with generally higher real interest rates in international capital markets brought on by the Volcker deflation.

There are several reasons to expect that the value of potential tax credits to banks depends on the maturity of the international loans. First, banks are expected to value near-term credits stemming from short term loans relatively highly, as banks that know they need such credits are expected to be willing to pay considerably to obtain the credits. Second, short term credits should be relatively valuable, as they cannot be reduced in value by changes in the withholding tax regime in the borrower country or in the creditability of these withholding taxes in the creditor country.[12] To conclude this section, we test whether the value of potential foreign tax credits indeed depends on loan maturity. For this purpose, we split the sample for the years 1975-1981 into two parts: loans with a maturity of three years or less, and loans with a maturity of four years or more. The results of the two regressions for the separate subsamples are reported in Table 5. The estimates of β are 0.595 and at 0.102 for shorter and longer term loans, respectively. These results suggest that potential short term credits are indeed valued relatively highly by the banks.

4. *Conclusion*

This paper presents evidence that prospective tax credits available to commercial banks for withholding taxes paid in developing countries have been reflected in international interest rates. With the increasing volume of LDC borrowing in the 1970s, foreign tax credit provisions gained increased attention from policy makers in both debtor and creditor countries. It is interesting, therefore, to review how tax authorities in the two sets of countries reacted. The prospects of higher foreign tax credits provides debtor countries with clear incentives to increase withholding tax rates. The withholding tax rates charged by the developing countries, however, have remained fairly stable. Tax rates may not have been increased, because policy makers in the developing countries thought that higher withholding taxes would reduce net-of-tax interest rates very little, or

they feared that the creditor country governments would in turn restrict the availability of the foreign tax credit. Indeed, U.S. tax rules regarding soak-up disallow a foreign tax credit for withholding taxes on interest payments whose rates are tailored to the income tax rate of the country of the lender. In a more suble way, Brazil has attempted to make the most of nonresident interest withholding taxes by providing domestic borrowers with corresponding partial domestic withholding tax rebates. This way the Brazilian authorities wished to bring about lower net-of-tax international interest rates, while minimizing the negative impact of nonresident withholding taxes on domestic borrowers.[13]

The value of creditor country tax credits has been substantial. In 1976 and 1978, U.S. banks, for instance, received foreign tax credits of $212.6 and $277.0 million, respectively.[14] In response, several creditor governments have taken measures to restrict the creditability of interest withholding taxes. The United Kingdom, specifically, limited the creditability of Brazil's withholding tax to 15 per cent in 1982, while Brazil's actual withholding tax rate was 25 per cent. The 15 per cent U.K. limit now applies to all debtor countries.[15] In the 1986 Tax Reform Act, the U.S. introduced an income basket approach for determining foreign tax credits. A separate income basket was created for high withholding tax income, which is (gross) interest income taxed at a withholding tax rate of 5 per cent or more. Available tax credits are calculated for each income basket separately. The result of this approach is that foreign tax credits associated with high interest withholding tax income can no longer be used to extinguish the U.S. tax liability on other-type foreign source income. Effectively, the basket approach has limited the creditability of interest withholding taxes.[16]

This paper provides evidence that during the 1979-1981 period pre-tax interest rates in the LDC loan market did not significantly reflect potential foreign tax credits. Interest rates generally are not expected to reflect potential tax credits at times when creditor banks are not profitable enough to value additional potential foreign tax credits highly. A bank's ability to realize potential foreign tax credits depends in part on non-interest foreign source income and costs. The impact of these factors on the level of gross interest rates paid by private borrowers in developing countries is arbitrary and probably unintended. In essence, it stems from the differences in the tax base for the nonresident withholding tax, as applied by the borrower country, and the tax base for the

bank's corporate income tax, as applied by the creditor country. A closer alignment of tax base definitions in debtor and creditor countries can be helpful in eliminating the present foreign tax credit related connection between international interest rates and the overall tax positions of creditor institutions.

Appendix: Description of data sources

The World Bank's Debtor Reporting System provides the following information on a loan by loan basis: debtor nationality, creditor nationality, month of loan origination, month of loan maturity, loan amount, and the interest rate spread. The loans in the sample are all to the private sector, denominated in U.S. dollars, and they specify the spread above LIBOR. Some loans with multiple creditor countries are included in the sample, if the debtor country imposes a uniform interest withholding tax on all outgoing bank interest payments.

Information on the country's overall debt outstanding, and also on debt service are derived from the Debtor Reporting System.

Tax rates are compiled from the following sources:

- *Corporate Taxes, a Worldwide Summary* (previously called *Corporate Taxes in 80 Countries*), Price Waterhouse (New York), various issues.
- *International Tax Summaries*, Coopers and Lybrand (Wiley, New York), various issues.

And also from the following publications of the International Bureau of Fiscal Documentation in Amsterdam:

- *African Tax Systems*, Looseleaf, E. de Brauw-Hay and F. Butzelaar-Mohr, eds..
- *Taxation in Latin America*, Looseleaf, P. Masson-Parodi, editor.
- *Taxes and Investment in Latin America* Looseleaf, J. van Hoorn, Jr., ed..

In some cases, tax rates have been interpolated or extrapolated, as tax rates are not available for all countries for all years. Tax rates, and especially internationally negotiated tax rates, however, tend to vary little from year to year.

All other data are from the International Financial Statistics of the International Monetary Fund. Gross Domestic Product is used instead of Gross National Product, if the latter is not available.

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Table 1. Loans by Debtor Country.

Debtor Country	Number	$\tau_w \cdot 100$	Spread
Brazil	189	24.76	1.64
Chile	33	0.00	1.96
Costa Rica	48	0.00	1.84
Côte d'Ivoire	4	25.00	1.81
Cyprus	1	10.00	1.75
Dominican Republic	9	18.00	1.58
Gabon	2	18.00	1.88
Honduras	24	5.00	1.66
Jamaica	3	15.33	1.50
Korea	168	20.55	1.20
Mexico	21	21.00	0.98
Paraguay	2	30.00	1.01
Portugal	4	15.00	1.00
Turkey	2	0.00	1.75

Note: Data are unweighted averages. τ_w is the withholding tax rate and Spread is the contractual interest spread

Table 2. Regressions with a Single Withholding Tax Variable.

	1971-1981	1975-1981
τ_w	0.123	0.164
	(3.88)	(4.84)
Inf	-0.059	0.114
	(1.26)	(2.01)
Invgnp	-0.038	-0.069
	(0.73)	(1.29)
Debtgnp	0.089	0.049
	(2.80)	(1.50)
Debtsexp	-0.001	-0.006
	(0.14)	(1.13)
Resgnp	0.042	0.115
	(0.33)	(0.82)
Resimp	-0.007	-0.020
	(1.26)	(3.09)
Impgnp	-0.215	-0.368
	(1.17)	(1.77)
Amount	-0.125	-0.079
	(2.17)	(1.22)
Mat	-0.003	-0.004
	(3.92)	(3.60)
R^2	0.71	0.77
N	510	379

Note: The dependent variable is S. Parentheses indicate t-statistics.

(Table 2, cont.)

Variables definitions are as follows:

S	=	one minus the withholdig tax rate, times the contractual interest rate spread divided by the net interest rate.
τ_w	=	interest withholding tax rate (as a share)
Inf	=	rate of inflation (quarterly)
Invgnp	=	ratio of investment to GNP (annual)
Debtgnp	=	ratio of external debt to GNP (annual)
Debtsexp	=	ratio of debt service to exports (annual)
Resgnp	=	ratio of reserves to GNP (annual)
Resimp	=	ratio of reserves to imports (annual)
Impgnp	=	ratio of imports to GNP (annual)
Amount	=	loan amount in billions of U.S. dollars
Mat	=	loan maturity in years

Table 3. Regression with Withholding Tax Variables for Different Years and Creditors.

	All creditors	USA	UK	Other
τ_w, 1975	0.240	0.324	0.215	0.217
	(3.06)	(3.19)	(2.24)	(2.46)
τ_w, 1976	0.130	0.199	0.135	0.113
	(2.25)	(2.38)	(1.51)	(1.82)
τ_w, 1977	0.332	0.366	0.430	0.331
	(7.20)	(6.20)	(3.95)	(6.69)
τ_w, 1978	0.170	0.232	0.150	0.166
	(3.13)	(3.61)	(2.12)	(2.76)
τ_w, 1979	0.066	0.029	0.124	0.045
	(1.08)	(0.30)	(1.57)	(0.63)
τ_w, 1980	0.002	0.001	-0.009	-0.014
	(0.03)	(0.01)	(0.10)	(0.19)
τ_w, 1981	0.014	0.033	-0.006	0.042
	(0.20)	(0.25)	(0.69)	(0.55)
Inf	-0.012		-0.033	
	(0.19)		(0.50)	
Invgnp	0.067		-0.054	
	(1.29)		(1.01)	
Debtgnp	0.095		0.112	
	(2.74)		(3.15)	
Debtsexp	-0.012		-0.012	
	(2.18)		(2.11)	
Resgnp	0.144		0.129	
	(0.97)		(0.83)	
Resimp	0.016		-0.013	
	(2.20)		(1.65)	
Impgnp	-0.625		-0.643	
	(2.94)		(2.94)	
Amount	0.072		-0.072	
	(1.12)		(1.07)	
Mat	-0.004		-0.005	
	(4.53)		(4.42)	
R^2	0.79		0.79	
N	379		379	

Note: The sample period is 1975-1981. The dependent variable is S. Parentheses indicate t-statistics. Variables are defined in Table 2. US and UK creditors provided 106 and 91 loans.

Table 4. U.S. Banks' Income and Taxes.

	Banks traded on NYSE		Top 10 banks	
Year	Gross Income / Assets	Taxes / Gross Income	Gross Income / Assets	Taxes / Gross Income
1971	0.95	32.22	0.90	34.87
1972	0.82	30.70	0.77	33.05
1973	0.78	31.95	0.75	35.38
1974	0.73	31.60	0.73	35.66
1975	0.78	33.96	0.78	38.21
1976	0.76	33.50	0.74	37.32
1977	0.73	32.69	0.69	35.48
1978	0.82	34.50	0.79	37.82
1979	0.83	32.48	0.80	36.61
1980	0.81	30.80	0.79	35.72
1981	0.75	24.45	0.68	29.86

Date Source: Bank Compustat. All numbers are percentages. The top 10 banks are: Citicorp, BankAmerica, Chase Manhattan, Manufacturer's Hanover, J.P. Morgan, Cheminal, Security Pacific, First Interstate, Bankers Trust and First Chicago.

Table 5. Regressions for Short and Long Maturity Loans.

	Mat ≤ 3	Mat ≥ 4
τ_w	0.595	0.102
	(5.36)	(2.91)
Inf	-0.042	0.152
	(0.27)	(2.06)
Invgnp	0.039	-0.069
	(0.17)	(1.27)
Debtgnp	0.042	0.112
	(0.48)	(2.93)
Debtsexp	0.020	-0.003
	(1.85)	(0.47)
Resgnp	-0.848	0.219
	(1.76)	(1.55)
Resimp	0.067	-0.025
	(2.42)	(3.84)
Impgnp	-0.165	-0.435
	(0.27)	(1.96)
Amount	0.862	-0.102
	(0.42)	(1.53)
Mat	0.005	-0.005
	(0.94)	(4.01)
R^2	0.84	0.74
N	65	314

Note: The sample period is 1975-1981. The dependent variable is S. Parentheses indicate t-statistics. Variables are defined in Table 2.

Endnotes

1. Demirgüc-Kunt and Huizinga (forthcoming) instead examine how withholding taxes on equity returns accruing to nonresidents affect pre-tax returns on emerging stock markets in developing countries during the 1987-1992 period.

2. Brazil, Colombia and Indonesia, however, are exceptions to this rule among the developing countries (KPMG, 1988).

3. An apparent was that German banks could hold Deutschmark bonds for their customers without reporting such holdings to the tax authorities.

4. The switch in IRS policy regarding the creditability of nonresident interest withholding taxes associated with net interest rate loans was not initiated by the IRS and did not result from litigation. Instead, the banking sector and, in particular, Citicorp challenged existing IRS practice indirectly by claiming foreign tax credits on their tax returns for net interest rate as well as gross interest rate loans. On a technical basis, the IRS decided to honor the claimed foreign tax credits on net interest rate loans. This tacit switch in IRS practice became common knowledge in the U.S. banking sector sometime in the second half of the 1970s.

5. This is the case for a U.S. bank, if it does business in the source country through a branch. Otherwise, the withholding tax is treated as a non-creditable excise tax.

6. As an example, let τ_w be 0.20, let i be 0.10, and let i* be 0.08. The gross interest rate, i_g, is 0.125 (from 0.10/(1.0 - 0.2)). Per dollar lent, the tax withheld by the borrowing country is 0.025 (from (0.10*0.20/(1 - 0.20)). Income by creditor country definition is 0.045 per dollar lent. This means that the effective borrowing country tax - by creditor country definition - is 56 (from 0.025/0.045) per cent rather than 20 per cent. This implies that the bank may well be in excess credit position, as 56 per cent exceeds, for instance, the top U.S. corporate tax rate.

7. The discussion assumes that (i) banks can obtain foreign tax credits for withholding taxes paid to the point where creditor country taxes on foreign source income are zero, and that (ii) banks earn no excess profits. Neither assumption fully reflects reality. In practice the international banking market consists of banks from many countries that differ in the domestic tax relief that is provided for foreign withholding taxes. Treatments range from no relief at all, a mere deduction, and a credit with limits as for U.S. banks, to a credit without any geographical limits (see Foreign Tax Credits for Banks, KPMG, pp. 20-23 for a summary for all major credit countries). Countries further frequently apply different rules for different debtor countries depending on bilateral tax treaties. The second assumption of no excess profits clearly is only an approximation as well. A full treatment of the supply side of the international loan market, taking into account the number of creditor countries, the number of banks in each creditor country, all countries' tax treatments of foreign source income, etc., is beyond the scope of this paper.

8. Loan default and the ex post availability of foreign tax credits are assumed to be independent events.

9. Alternatively, we can assume that the interest rate faced by borrowers is the net interest rate if governments offer their private borrowers withholding tax rebates. Replacing i_g by i in (3) and using (2) we can now derive

$$\frac{i - i^*}{i} = \sum_{i=1}^{n} \gamma_i (1 + i^*) x_i - \beta \frac{\tau_w}{1 - \tau_w} \qquad (4')$$

Now it is seen that $di/d\tau_w > 0$. Regressions analogous to those in Table 2 based on (4') show an insignificant β parameter, which suggests (3) is in fact the correct specification.

10. Feder and Just [1977] and Edwards [1984] assume borrower nation specific error components rather than region specific components. Such an error structure in the present context precludes an independent effect for withholding taxes on the variable S, as tax rates vary little for loans contracted by the same borrower.

11. The latter effect may in part reflect the term structure of interest rates.

12. Note that changes in U.S. tax regulations regarding the creditability of foreign withholding taxes are likely to be accompanied by 'grandfather rules' exempting outstanding loans from the regulatory changes.

13. These withholding taxes are essentially fraudulent and they do not qualify for a foreign tax credit under U.S. law.

14. See Internal Revenue Service Statistics of Income - 1976-1979, International Income and Taxes, Foreign Income and Taxes Reported on U.S. Income Tax Reforms, Table 2, p. 97 and Internal Revenue Service Statistics of Income, Compendium of Studies of International Income and Taxes, Table 1, p.36.

15. See Foreign Tax Credits for Banks, KPMG, p. 171.

16. Somewhat ironically, the 1986 Tax Reform Act, which reduced tax incentives for foreign lending, just followed the Baker plan for dealing with third world debt launched in 1985, which called for continued voluntary commercial bank lending to the highly indebted developing countries.

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