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A Note on the Taxation of Banking Activity in Costa Rica

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CONTENTS:

The purpose of this note is to make some brief observations on the proposal to tax demand and time deposits in Costa Rica. This note does not provide in-depth analysis of the proposed legislation (but rather explores the potential for fiscal revenue from taxing banking transaction in Costa Rica.

The note discusses the effects of the Chilean inflation tax on banks during the period from 1976 to 1980 on the amount of revenue collected by the government through this tax.

CONCLUSIONS:

The author concludes that, although the urgent need for the resolution of some of the fiscal problems of Costa Rica is understandable, the proposed legislation for turnover taxes on demand and time deposits appears ill-advised.

Moreover, the author contends, any increase in taxes on banks will adversely affect production and investment in Costa Rica.

(1) The points of view, suggestions, recommendations and conclusions expressed by the authors are not necessarily those of OPS.

(2) For a more detailed discussion of the characteristics of this tax proposal see Occasional Paper No.003 LOS GRAVAMENES A LA INTERMEDIACION FINANCIERA and Occasional Paper No. 005 IMPUESTO A LAS TRANSACCIONES FINANCIERAS: PROYECTO DE LEY DEL APOORTE SOLIDARIO NACIONAL.

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The purpose of this note is to make some brief observations on the proposal to tax demand deposits and time deposits in Costa Rica. This note does not provide an in-depth analysis of the proposed legislation, but rather explores the potential for fiscal revenue from taxing banking transactions in Costa Rica.

1. Tax Revenue from Banks

The proposed Costa Rican tax will levy a certain percentage per demand deposit over the course of a year. If a firm deposits money into its checking account once a week, the firm will pay an annual tax rate of at least 50 percent on its average checking account balance. Balanced against that tax rate will be the real return the firm earns on its checking account balances (either directly in the form of interest or indirectly in the form of bank services). Let τ be the annual tax rate on demand deposits and r^d be the real return on demand deposits. Assuming that the firm's bank lends out the demand deposits at an interest rate r^l , the following relationship will hold:

$$r^d = r^l - \tau$$

Similarly, a person depositing a 90-day time deposit will incur a tax of at least five percent per year if the deposit is renewed each time it expires. Letting γ be the annual tax rate on time deposits and r^t be the real interest rate on time deposits, the following relationship will hold:

$$r^t = r^d - \gamma$$

Assuming that the sources of funds for bank loans are demand deposits and time deposits ($l = d + t$), revenue from the taxation of demand deposits and time deposits can be written in several different ways by making use of the two preceding interest rate relationships:

OT.1.

$$\begin{aligned}
 \text{Revenue} &= \tau d + \gamma l \\
 &= (r^d - r^l)d + (r^l - r^f)l \\
 &= (r^d - r^l)d + (r^l - r^f)(1 - d) \\
 &= (r^d - r^l)d + (r^l - r^f)l
 \end{aligned}$$

The first expression gives revenue in terms of the tax rates (τ and γ) times the base for the tax (d and l). The additional three lines show that the revenue from the tax can be equivalently expressed in terms of the interest rate spreads produced by the tax times the stock of demand deposits and the stock of loans.

Figure 1 shows tax revenue from the proposed bank tax in terms of supply and demand schedules for demand deposits and bank loans. In Figure 1 the real interest rate on time deposits is given by the horizontal line at r^l . The supply schedule of demand deposits is upward sloping, and one component of the revenue from the tax is the shaded box A, whose area is $(r^l - r^d)d$. The demand schedule by firms for bank loans is downward-sloping, and the second component of tax revenue is the shaded box B, whose area is $(r^l - r^f)l$.

To get a rough idea of the potential tax revenue, suppose that the tax on demand deposits creates a spread $(r^l - r^d)$ of about 50 percent. Since the ratio of demand deposits to GDP is about 10 percent in Costa Rica as of 1989 (according to *International Financial Statistics* of the International Monetary Fund), the tax would collect 5 percent of GDP, assuming that the level of demand deposits does not fall in response to the lower real return. Similarly, suppose the tax on time deposits raises the spread $(r^l - r^f)$ by five percentage points, so that the real lending rate will rise from a level of about 15 percent to 20 percent. Since bank loans to the private sector were about 16 percent of GDP in 1989, the tax would levy an additional 0.8 percent of GDP, provided that loan demand remains unchanged in the face of a higher real lending rate.

With a fifty percent tax on demand deposits, the supply of demand deposits will shrink as firms switch to using currency, establish informal credit-clearing arrangements, or

slow down the frequency with which they make payments. With a fifty percent tax, the supply of demand deposits will probably shrink by at least half, thereby generating revenue of 2.5 percent of GDP. The demand for loans will also shrink, so that the revenue from the tax on time deposits will be less than 0.8 percent of GDP.

II. Inflation Tax Revenue from Banks

A common way to collect revenue from banks is to impose reserve requirements on deposits. When the required reserves pay no interest (or less than the market-clearing interest rate), they are a tax on banks. The tax revenue is known as inflation tax revenue from banks because the opportunity cost of holding required reserves (the nominal lending rate) is directly correlated with the inflation rate. Letting ρ^d be the reserve ratio on demand deposits, ρ^t be the reserve ratio on time deposits, i^d be the nominal rate of return on holding demand deposits, i^t be the nominal interest rate on time deposits, and i^l be the nominal lending rate, then the following conditions hold:

$$i^d = (1 - \rho^d)i^l$$

$$i^t = (1 - \rho^t)i^l$$

As in the case of the bank tax analyzed in Section I, the inflation tax revenue can be written in several alternative forms:

$$\begin{aligned} \text{Revenue} &= i^l(r^d d + r^t t) \\ &= (i^l - i^d)d + (i^l - i^t)t \\ &= (r^l - r^d)d + (r^l - r^t)(1 - d) \\ &= (r^l - r^d)d + (r^l - r^t)l \end{aligned}$$

It is readily apparent that revenue from the inflation tax can be expressed in equivalent form as revenue from the proposed bank tax. This should not be surprising, since the incidence of any tax on banks must fall on depositors or borrowers.

Table 1 gives some illustrative figures on the amount of revenue the Chilean government collected from the inflation tax on banks during the period between 1976 and 1980. As can be seen, the Chilean government collected about 4 percent of GDP from the inflation tax on banks in 1976, 2 percent in 1977, 0.8 percent in 1978, 0.6 percent in 1979, and 0.4 percent of GDP in 1980. During this time period the real lending rate was very high: 64 percent in 1976, 57 percent in 1977, and 42 percent in 1978 before falling to 17 percent in 1979 and 12 percent in 1980.

Without more detailed information, it is impossible to calculate the current level of inflation tax revenue on the banking system in Costa Rica. If required reserves pay no interest, the change in required reserves divided by GDP is the amount of the inflation tax on banks. If the central bank pays interest on required reserves, however, inflation tax revenue will be reduced by the amount of the interest payments. The third column of Table 2 suggests that the level of inflation tax revenue collected from the banking system in Costa Rica is currently around 2 - 3 percent of GDP. This high level of inflation tax revenue is consistent with the high average reserve ratio of about 40 percent to which banks in Costa Rica are currently subject.

III. Real Effects of Bank Taxation

So far the analysis of this note has abstracted from the real consequences of bank taxation. This section and the following will provide a conceptual framework for understanding the consequences of raising the tax rate on banks.

Suppose that demand deposits are part of a firm's working capital, so that they can be entered into the firm's production function along with capital (K) and labor (L):

$F(K, L, d)$. Suppose also that firms finance their investment in capital with bank loans. Then the value of a firm (V) can be written as follows, where qK is the market price of the firm's capital stock:

$$V = qK = \int_t^{\infty} [F(K, L, d) - wL - (r^l - r^d)d - \psi(I, K)] e^{-r^d(s-t)} ds$$

where wL are wage payments to labor, $r^l - r^d = \tau$ is the tax rate on demand deposits, and $\psi(I, K)$ is a standard investment expenditure function for the firm. In this model, investment is a function of q , the market price of the firm's capital stock. In Figure 2, the $\dot{K} = 0$ line and the $\dot{q} = 0$ lines serve as references for the optimal investment path for the economy. In Figure 2, whenever the value of the firm's capital is greater than the long-run level \bar{q} , the firm will want to invest. On the other hand, if the value of the firm's capital is below \bar{q} , the firm will disinvest. The optimal investment path without the bank taxes is shown by the heavy line JJ' .

Bank taxes will lower the value of firms in two ways: the taxes will cause firms to lower their working capital, thereby reducing output, and will also raise the borrowing rate, thereby reducing investment. Both taxes lower the value of the firm, qK . In Figure 2 the effect of these taxes is to cause a reduction in the value of the firm from \bar{q} to q_0 , so that the firm's new optimal investment path leads from point C to point H, and a lower level of capital and output.

IV. Bank Taxation and Government Deposit Guarantees

The real consequences of increased bank taxes illustrated in Figure 2 are for a world in which there are no government deposit guarantees. If a country's government does guarantee deposits, the outcome of increased bank taxation will probably be different than the outcome shown in Figure 2.

Tax revenue from banks of the amount currently under consideration in Costa Rica -- 6 - 10 percent of GDP in addition to the 2-3 percent currently collected from the inflation tax -- will adversely affect firms, as shown in Figure 2. If the adverse effects are great enough, a number of firms will become insolvent, so that the firms' value $V = qK$ will fall below the outstanding debt of the firms. The inability of firms to meet their debt payments may, in turn, cause banks to become bankrupt.

The existence of government deposit guarantees can, however, disguise the negative impact of the higher bank taxes. Deposit guarantees obligate the government to buy a bank's assets for a price no less than the value of insured deposits. In a situation in which higher bank taxes would normally cause banks and firms to become bankrupt, deposit guarantees permit a bank to continue operating. With deposit guarantees, the bank can allow bankrupt firms to roll over their loan losses.

Deposit guarantees also allow banks to pay high banking taxes to the government by bidding for deposits at a high rate and using those deposits to pay the taxes. What appears to be tax revenue may turn out to be funds borrowed against the government's deposit guarantee, so that the government eventually has to take over the banking system at a cost at least equal to the revenue it collected earlier.

Figure 3 illustrates the type of adjustment to the imposition of high bank taxes that may occur in the presence of deposit guarantees. In Figure 3, the bank taxes produce a capital loss of the amount of the rectangle $\bar{q}ACq_0$. If the firm's equity is only equal to the area of $\bar{q}ABq_1$, then the firm will go bankrupt and leave the bank with a loss of q_1BCq_0 .

With many firms, there will be many such losses for the bank. If the bank is only thinly capitalized, the bank too will go bankrupt. However, with deposit guarantees, the bank can continue to lend to firms, rolling over the principal plus interest on their loans.

If it is known that the government will not intervene in the banking system until some point in time in the future, the investment path for the firm will be given by the curve DE rather than the path CH in Figure 3. Along the path DE the firm will be investing in capital for sale to one buyer: the government. At the time the government intervenes in the banking system, it will be forced to take over bankrupt firms as well. In Figure 3, the price that the government pays for the capital is \hat{q}_T . After taking over the banks and firms, the price at which the government can sell the capital is q_T , thereby placing the firm on the optimal investment path leading to point H. The cost to the government of the takeover is the area of the rectangle $\hat{q}_T E F q_T$.

The existence of a deposit guarantee permits the bank to turn a large proportion of the bank tax into a future government debt liability by allowing the bank to serve as an intermediary between the final user of funds (the government) and the final lenders (depositors). In the process, the distortion of investment incentives will result in an intertemporal speculation against the government prior to the expiration of the government's guarantee.

Table 1 shows that the total of the Chilean government's tax revenue from the banking system during the five-year period from 1976 to 1980 was about 8.0 percent of GDP. A number of observers, however, believe that the high rate of taxation produced a large portfolio of bad loans by the end of 1976 that were then rolled over by banks. Although the banks' problems remained hidden for five years, the Central Bank of Chile eventually became responsible for the loan losses in 1983. The cost of the bank bailout in Chile has been estimated in the range of 15 to 20 percent of GDP. This cost might have been avoided, or at least reduced, if banks had not been taxed at such a high rate prior to 1980.

V. Conclusion

Although one can understand the urgent need for the resolution of some of Costa Rica's fiscal problem, the proposed legislation for turnover taxes on demand deposits and time deposits appears ill-advised. The tax would be levied in addition to taxes currently in place on banks. The inflation tax, in particular, already appears to account for 2 - 3 percent of GDP.

The proposed lower bound on revenue from the tax (6 percent of GDP) is probably unattainable. A more realistic *upper* bound would be 2 - 3 percent of GDP.

Any increase in taxes on banks will adversely affect production and investment in Costa Rica. In addition, the presence of deposit guarantees will make it very difficult to determine whether the tax revenue generated by the new taxes is indeed tax revenue, or whether it simply is borrowing against a future fiscal obligation to bail out depositors of a bankrupt banking system.

Table 1
Inflation Tax Revenue from Banks in Chile: 1976 - 1980
 (All Figures are in Percentage Terms)

	1976	1977	1978	1979	1980
1. Legal Reserve Ratio on Demand Deposits	83	70	47	42	16
2. Legal Reserve Ratio on Time Deposits	58	36	20	15	4
3. Short-Term (30-day) Nominal Interest Rate	198	100	64	46	39
4. Interest Paid on Time Deposit Reserves	166	85	58	30	0
5. Demand Deposits/GDP	2.0	2.4	2.5	2.3	3.1
6. Time Deposits/GDP	3.5	5.9	7.3	9.1	10.6
Inflation Tax Revenue/GDP:					
Demand Deposit Component (Row 1)(Row 3)(Row 5)	3.3	1.7	0.7	0.4	0.2
Time Deposit Component (Row 2)(Row 3 - Row 4)x (Row 6)	0.7	0.3	0.1	0.2	0.2
Total Revenue	4.0	2.0	0.8	0.6	0.4
Real Interest Rates (Annualized):					
30 - 89 Day Time Deposit Rate	8.6	18.7	25.0	4.7	5.0
30 - 89 Day Lending Rate	64.2	57.1	42.3	16.9	12.2

Source: Banco Central de Chile, *Indicadores Económicos y Sociales 1960 - 1988*.

Table 2
 Estimated Upper Bound on Inflation Tax Revenue
 from Banks in Costa Rica, 1983 - 1989

	Required Reserves	Nominal GDP	Change in Reserves/GDP (Percent)	Average Reserve Ratio (Percent)
1983	12069	126337	2.6	25
1984	14432	163011	1.5	25
1985	22986	197920	4.3	35
1986	29344	246579	2.6	37
1987	34029	284339	1.7	37
1988	45874	355968	3.3	37
1989	60320	433136	3.3	39

Source: International Monetary Fund, International Financial Statistics

Note: The maximum inflation tax revenue is given by column three, and will be accurate if all required reserves pay no interest.

The average reserve ratio is the ratio of bank reserves divided by bank deposits.

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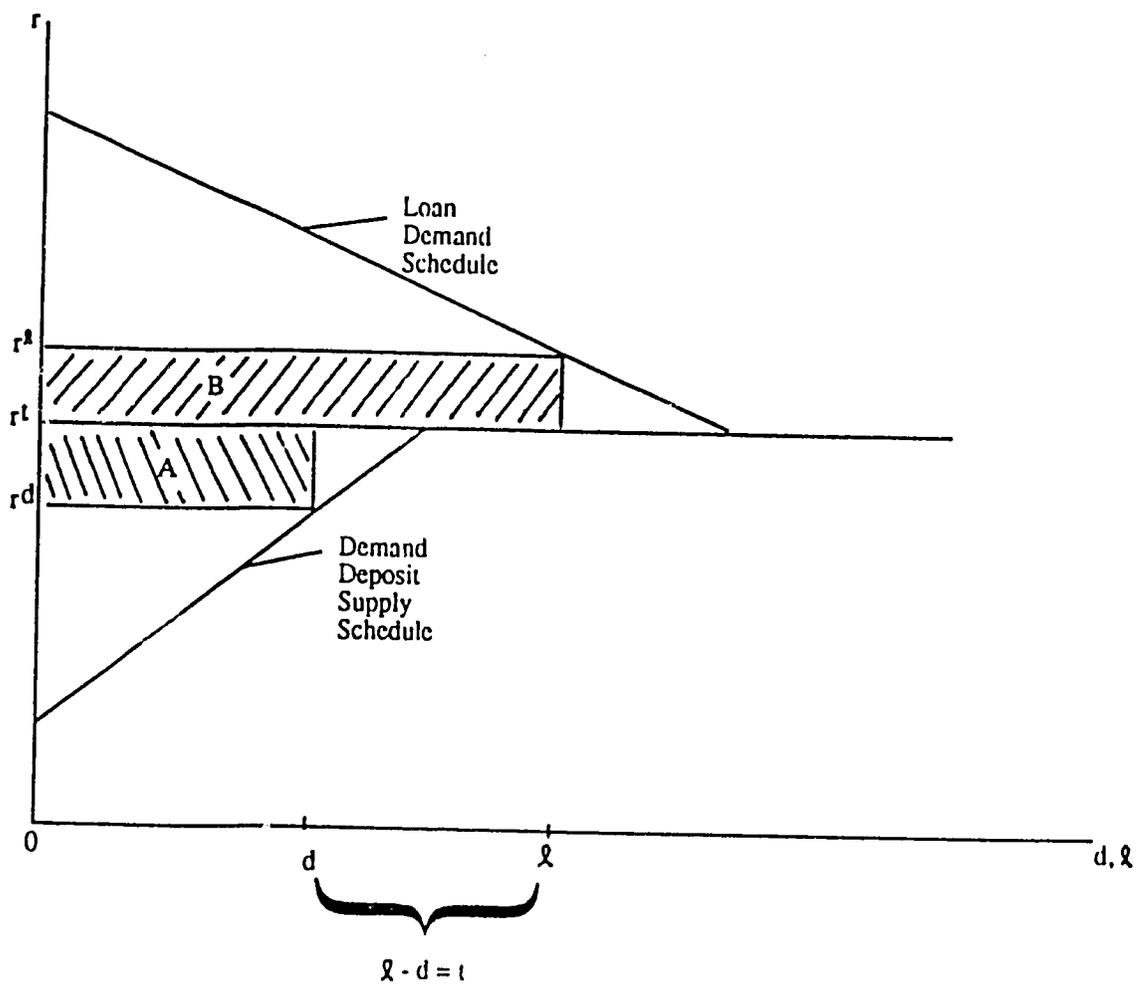


FIGURE 1.
REVENUE FROM THE TAXATION OF BANKING

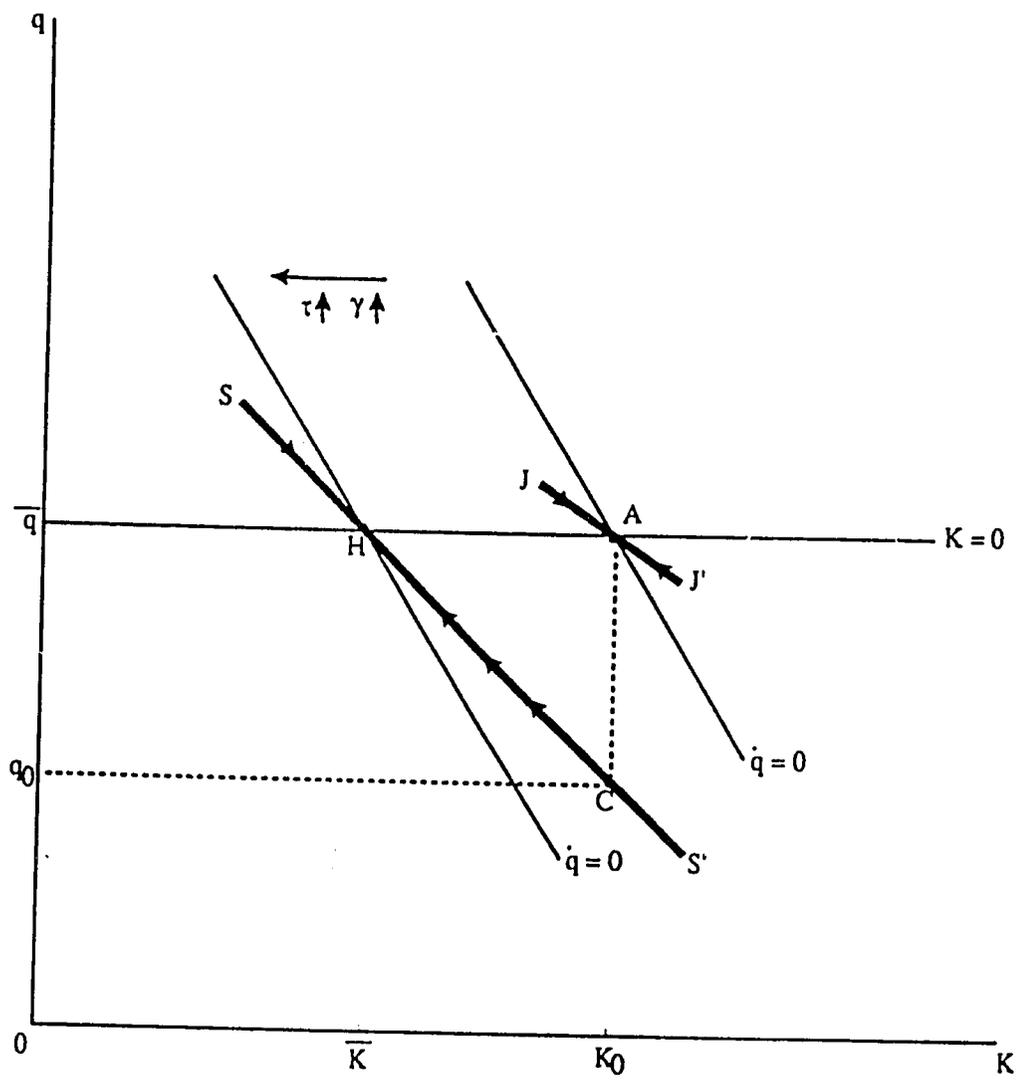


FIGURE 2.
ADJUSTMENT OF THE CAPITAL STOCK TO
INCREASED BANK TAXATION

