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Government Revenue from Financial Repression

By ALBERTO GIOVANNINI AND MARTHA DE MELO*

This paper provides empirical evidence on the effects of financial repression on government finances. Financial repression is a combination of controls on international capital flows with restrictions on domestic interest rates. The result is an artificially low cost of domestic funding to governments. We estimate the government revenue from financial repression as the difference between the foreign and the domestic cost of funds, times the domestic stock of government debt. The evidence indicates that the revenue from financial repression can be quite substantial, and for several countries it is of the same order of magnitude as seigniorage. (JEL H60, H63, H87, F34, F36)

Most developing countries impose controls on international capital flows, coupled with controls on domestic financial intermediaries. These phenomena have been extensively studied in development economics and are generally labeled "financial repression."

Analyses of the effects of financial repression, like those by Ronald McKinnon (1973), Edward Shaw (1973), and Maxwell Fry (1988), point to the inefficiencies arising from controls on international asset trade and domestic financial intermediaries and set forth clear-cut policy prescriptions, which have been followed by a number of countries, under the auspices of international institutions. These prescriptions envisage removal of controls on international asset trade, together with the removal of price and quantity rationing in domestic financial intermediation.¹

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¹Recent work has stressed the importance of the appropriate sequencing of liberalization policies (see e.g., Sebastian Edwards, 1984; Edward F. Buffie, 1984; Vittorio Corbo and Jaime A. P. de Melo, 1987.

While the theoretical analyses of the effects of controls on financial markets are undoubtedly correct, their direct policy applications have neglected the presence of important related distortions in the economy. More satisfactory approaches to financial liberalization should explicitly account for such distortions, including those associated with government spending and taxes. In particular, considering the effects of government revenue constraints and the distortions associated with different forms of taxation would provide a more complete assessment of the costs and benefits of financial controls and financial liberalization.²

In this paper we produce empirical evidence to highlight the interactions of financial controls and tax policies. We regard government-imposed controls on domestic financial markets as a form of taxation and estimate the amount of revenue that developing countries have obtained from it. Our approach is a natural extension of the ideas of Edmund S. Phelps (1973) and his followers, who pioneered the study of government

²For analysis of public-finance aspects of the distortions in financial markets, see Christophe Chamley and Qaizar Hussain (1988), Giovanni (1988), Aaron Tornell (1988), Rudiger Dornbusch and Alejandro Reynoso (1989), William R. Easterly (1989), and Dornbusch and Giovanni (1990). For public-finance analyses of trade protection in LDC's see in particular Pradeep K. Mitra (1987) and Christopher J. Heady and Mitra (1987).

macro policies and their distortions from the perspective of public finance.³ While we do not attempt to provide any normative statement on whether or not liberalization is a desirable strategy to follow,⁴ we wish to point to the first-order impact of liberalization policies on government budgets. The size of government revenue from financial repression indicates the extent to which liberalization policies need to be accompanied by changes in taxation and government spending.

Section I discusses the issues and, in particular, the linkage with international capital controls, the choice between financial repression and other taxes, and the distinction and interaction between financial repression and the inflation tax. Section II describes the data set, which comprises data for 24 countries over the 1972–1987 period, and the methodology we have adopted in the empirical work. Section III presents the estimates of government revenue from financial repression and compares them with the revenue from seigniorage. Section IV offers some concluding remarks. An appendix (not published) containing the data sources, all the details necessary to reproduce our data set, and country worksheets used in the calculations is available from the authors upon request.

I. The Issues

The term “financial repression” is often used to describe the effects of policies rather than the policies themselves: an artificially low level of interest rates (at least in the official financial sector) and the attendant distortions of financial intermediation, saving, and investment. Financial repression can be caused by a number of different policies, which typically include both price and quantity restrictions imposed on the domestic financial sector. Whichever are the

policies adopted, they always need to be accompanied by restrictions on international capital flows. Indeed, in the absence of restrictions on international capital flows, most restrictions on the domestic financial system could be easily bypassed through offshore financial intermediaries.

This paper, unlike much of the previous literature, exploits the international dimension of financial repression in order to calculate its economic importance. Financial repression allows governments to finance themselves at artificially low interest rates. If the interest that governments pay in world capital markets fairly reflects the shadow price of funds, the revenue directly accruing to them as a result of financial repression and capital controls can be measured as the difference between foreign and domestic interest rates, times the stock of domestic government liabilities. The base for the financial-repression tax we concentrate on is central-government debt, which provides a minimum empirical estimate of the wider concept.

Would financial repression be chosen by a government following optimal tax policies? In the standard open-economy optimal-tax problem illustrated, for example, by Avinash Dixit (1985 section 3.2), the production-efficiency theorem (Peter A. Diamond and James Mirrlees, 1971) applies: taxes can drive wedges between the marginal rate of substitution of any two commodities in consumption and the marginal rate of transformation, but they should not distort the marginal rate of transformation away from the foreign rate of transformation, which is represented by the world relative price of any two commodities. Hence, the domestic interest rate should not differ from the world interest rate, since any wedge would lead to suboptimal investment decisions, implying that output is not maximized at world prices and, therefore, that consumption opportunities are not maximized either.

There are, nevertheless, a number of reasons why governments might adopt a seemingly suboptimal tax, such as financial repression. The first is the presence of costs in the administration of alternative forms of

³Stanley Fischer (1982), for example, estimates the government revenue from the inflation tax.

⁴This would require working out the general-equilibrium effects of liberalization, including the effects on the volume and composition of tax revenue.

taxation. Roger H. Gordon and James Levinsohn (1989), for example, suggest modeling the administrative costs associated with the use of different tax bases as fixed costs: in order to set up the necessary bureaucracy to organize, administer, and monitor a given tax, the government has to incur an initial "capital" expense. In some countries, and for certain taxes, this initial expense may be very high. Income taxes or value-added taxes, for example, can be costly to raise in developing countries.⁵ The second factor that might justify the use of financial repression is the application of distributional criteria by the government. Redistribution objectives can be achieved by taxing the return to capital, thereby inducing the production distortions mentioned above and transferring income away from capitalists to wage-earners. Finally, political considerations may favor the less transparent means of taxation that is characteristic of financial repression.

In practice, financial repression is typically the result of nominal interest-rate ceilings that are well below the prevailing rate of inflation and currency depreciation. It is often argued, based on this fact, that the distortions in the real interest rates arising from inflation should be included in the definition of the inflation tax. This argument is incorrect, however, since the inflation tax base is high-powered money, while financial repression affects the portfolio of nonmonetary assets held by domestic residents.

The potential complementarities between the financial-repression tax and the inflation tax should, however, be recognized. First of all, the interest savings on government liabilities can be obtained following an infla-

tion policy that—given nominal interest-rate ceilings—implies very low real interest rates. Second, the presence of a limited array of financial instruments and negative real interest rates increases money demand, other things equal—that is, the inflation tax base (see Dornbusch and Giovannini, 1990).⁶ Another form of financial repression, the imposition of reserve requirements, directly increases the inflation tax base (by increasing demand for high-powered money, whenever required reserves are in cash).⁷

For all of these reasons, it is to be expected that the inflation tax is used together with financial repression in developing countries. We will consider below the extent to which this proposition is borne out in the data.⁸

II. The Data

Unlike other empirical studies of financial repression (e.g., Robert G. King and Ross E. Levine, 1992; Oren Sussman, 1992), we estimate the revenue from repressed interest rates directly, using data from national government accounts pertaining to domestic and foreign interest outlays and data on the domestic and foreign stocks of government debt. Our approach, while burdensome from the viewpoint of data collection, provides the most accurate estimates to date of the budgetary impact of financial repression. We avoid using interest-rate data

⁶In addition, it might be possible to produce examples in which the production distortions induced by the inflation tax are offset by the low domestic real interest rates that result from financial repression.

⁷In several countries, required reserves are in terms of government securities.

⁸The complementarity between these two forms of taxation, however, will break down at very high rates of inflation. In these cases the real return on domestic investments is so heavily depressed that there is flight toward safety—represented for example by gold, dollars, or other foreign assets—even if that entails substantial costs and risks of penalties. These phenomena have been documented, for instance, by Gail E. Maki-nen and G. Thomas Woodward (1990). The flight toward safety dries out financial markets *and at the same time* produces a drop in money demand; financial repression and the inflation tax become substitutes.

⁵Indeed, many countries (including industrial countries) estimate income taxes based on tangible wealth holdings of the taxpayers: see Organization for Economic Cooperation and Development (1988). A more accurate, voluntary system of tax assessment with the backup of government audits might not be viable in many poor countries. Value-added taxes require an efficient system of border adjustments, as well as a sophisticated method of tax assessment based on individual producers' returns.

since the very presence of controls makes the choice of a "representative" interest rate on domestic liabilities an almost impossible task and because there are no reliable breakdowns of domestic and foreign liabilities by type of loan and interest rate charged.⁹

Our measure of government revenue from financial repression includes only interest expenses of the central government; it excludes the central bank, state and local government, and government-owned enterprises whose low interest payments on their liabilities also represent indirect budgetary savings. Foreign borrowing costs are measured on external commercial debt only, and both domestic and foreign borrowing costs are measured *ex post*. That is, the foreign borrowing cost is the sum of the estimated dollar interest rate on external debt and the realized depreciation of the domestic currency relative to the dollar. The domestic interest cost is the estimated domestic-currency interest rate on domestic debt.

To compute the average foreign interest rate on commercial debt, total annual dollar interest payments (INTP\$) plus the change in interest arrears as reported to the World Bank *Debtor Reporting System* (DRS) by the debtor (INTA\$) are taken as a percentage of average annual dollar debt outstanding and disbursed (DOD\$). Arrears are included because we assume that countries face given world rates of interest; thus, including arrears allows us to obtain an estimate of the "normal" cost of borrowing.¹⁰

⁹In many countries, a breakdown of all the different types of government bonds, together with their contractual interest rates, is simply not available. Hence the potential for error by our method is much smaller. Independently of problems of data availability, our effective rates can differ from contractual rates for two reasons. First, there might be fluctuations in the timing of interest payments and in the declaration of foreign arrears. Secondly, there may be differences between the actual average stock outstanding and our estimates based on the average of end-of-period stocks.

¹⁰To the extent that actual arrears are greater than reported arrears, the normal cost of foreign borrowing—and hence the government revenue reported here—will be understated.

The DRS includes in interest payments any front-end or other fees if these are known: there were no rescheduled interest payments on commercial debt in the years and countries included in our sample. Thus the nominal effective dollar interest rate is

$$\text{EFFINT}\$(t) = \frac{[\text{INTP}\$(t) + \text{INTA}\$(t)]}{\{[\text{DOD}\$(t-1) + \text{DOD}\$(t)]/2\}}$$

where $\text{DOD}\$(t)$ indicates dollar debt outstanding and disbursed at the end of year t , and the average debt outstanding and disbursed during the year t is estimated through linear interpolation.¹¹ LIBOR-based borrowing of the central government only is used to determine the foreign cost, except for Algeria, Greece, and India, for which LIBOR-based borrowing of public corporations is used as a proxy.

For the domestic interest rate, annual local-currency interest payments on central-government domestic debt (INTP) are taken as a percentage of the average domestic debt outstanding. Typically, governments do not incur arrears on their domestic debt; but to the extent that they do, arrears are another form of financial repression and are correctly reflected by our effective-interest-rate method. Thus, the nominal effective domestic interest rate is

$$\text{EFFINT}(t) = \frac{\text{INTP}(t)}{\{[\text{DOD}(t-1) + \text{DOD}(t)]/2\}}$$

where $\text{DOD}(t)$ denotes total domestic debt outstanding and disbursed expressed in domestic currency, including holdings of monetary authorities. The holdings of monetary authorities are included in the calculations

¹¹It is possible to perform a rough check of the accuracy of our method by comparing the effective interest rate we obtain with LIBOR (London interbank offered rate). This comparison indicates that our estimates covary closely with LIBOR. Discrepancies are likely to arise because our estimates (correctly) include any commercial fees as part of the cost of the loan, and because of other reasons discussed elsewhere in this section.

of the effective interest rate because the treasury normally remunerates the central bank for its holdings of interest-bearing treasury debt.¹²

In addition to the foreign interest rate on dollar-denominated debt, there are two other components to the foreign cost of borrowing. One is, of course, the average annual change in the value of the domestic currency relative to the dollar, which is used to aggregate country debt data. This indicates the change in the local-currency value of the stock of external dollar-denominated debt. The other is the revaluation (in dollars) of external debt denominated in non-dollar currencies. It is captured by subtracting net dollar disbursements from the change in dollar DOD (adjusted for any rescheduling) from the beginning to the end of the year.¹³

Finally, the government revenue from financial repression is calculated by computing the differential between the foreign borrowing cost and the domestic borrowing cost, times the average annual stock of domestic debt. In this calculation, an important adjustment has been made to central-government domestic debt, namely, the elimination of debt held by the monetary authorities. Even though the central bank receives interest on its holdings, the acquisition of government debt is financed by increases in the money supply, and not by borrowing within a resource-constrained environment. Thus it has little to do with the existence or absence of financial repression and is different from, rather than a substitute for, foreign borrowing. Moreover, the interest rate paid on government debt held by the central bank is not really a cost, since interest receipts contribute to central-bank

profits which are typically returned to the budget.

Aside from restricting the government sector to central government, there are three other reasons why the estimates of the revenue from financial repression we report may be understated. First, we disregard the second-order effect of changes in the exchange rate on foreign interest payments. Second, arrears on foreign debt may be understated. And third, the stock of non-interest-bearing domestic government debt may be underreported: its inclusion would lower the estimate of the effective interest rate, thus raising the implicit tax on domestic lenders. It would also increase the estimate of the financial-repression tax base, thus raising the revenue from financial repression.¹⁴

The sample is composed of countries considered to be "developing" at some point during the period covered, which is 1972 through 1987. Given the basic approach explained above, the selection criteria have been (i) the existence of significant foreign commercial borrowing by the central government—indicated by a stock of commercial DOD of about \$200 million or more¹⁵—and (ii) the availability of data on the stock and cost of central-government domestic debt. A total of 38 countries can be identified by criterion (i). Criterion (ii) reduces the coverage to 24 countries and entails dropping primarily countries in Africa and Latin America. In addition, data are available for only part of the time period chosen for any one country.

In order to achieve maximum cross-country comparability, we try to use the same statistical sources. Calculations of the

¹²The taxable status of interest on internal government debt is ignored, since it can differ by debt holder as well as by debt instrument. Furthermore, it is arguably more transparent to consider revenues and expenditures separately (and therefore preferential treatment becomes a separate tax expenditure).

¹³These items can be positive or negative but have typically added to the foreign cost of borrowing. Both of these noninterest elements represent accrued cost, of which only part is amortized annually.

¹⁴In a separate appendix, not published but available from us upon request, we indicate the data sources and describe the calculations performed to obtain the government revenue from financial repression (a worksheet, containing all calculations, has been prepared for each country).

¹⁵Foreign commercial debt is defined as LIBOR-based borrowing in creditor categories 2 (financial institutions) and 6/7 (bonds floated on international financial markets) of the World Bank's *Debtor Reporting System*.

foreign cost of borrowing are based on external debt statistics from the World Bank DRS. To the extent possible, stocks of central-government domestic debt and holdings of these stocks by the monetary authorities and deposit money banks are taken from the International Monetary Fund (IMF) *Government Financial Statistics* (GFS). This is possible for eight countries, and the preferred concept of consolidated central government is used for all these countries except Jordan, for which only budgetary data are available. GFS data on total interest payments are broken down into their foreign and domestic components by locating a country-specific source with this information. Total interest payments from this country source approximate but do not always equal the GFS total.

For another seven countries, country-specific data on the domestic debt stock are quite close (within 10 percent) to GFS data, and the domestic interest payments used are consistent with this debt stock. For another six countries, domestic debt stocks are significantly different (more than 10 percent) from GFS data (higher for three countries and lower for three countries) but are the only central-government domestic-debt figures for which associated interest payments could be identified. Finally, GFS has no data on domestic debt for three countries (Algeria, Mexico, and Portugal), and therefore direct comparison with GFS standard definitions is not possible. Again, budgetary data are occasionally used when consolidated accounts, which include social security and extrabudgetary funds, are not available.

Country-specific sources for these data and central-government revenues are shown in our separate appendix. Data on gross domestic product (GDP), population, and the GDP deflator are also taken from GFS, and exchange rates are from the IMF's *International Financial Statistics*.

III. The Evidence

As explained in the previous section, the measure of the revenue from financial repression used here is the *ex post* differential

between foreign and domestic interest rates, times the stock of government debt held outside the central bank. This measure captures correctly any gains accruing to the government from differences between domestic and foreign costs of funds. However, it does not, in principle, allow a clean identification of financial repression, since realized exchange-rate changes can be surprises. Large unanticipated devaluations of the national currency can induce large revenues to governments that do not constrain domestic or international capital markets.

This identification problem can be controlled in three ways. First, we have a priori knowledge on the extent to which capital flows and domestic financial markets were controlled in the countries in the sample. Second, and more importantly, exchange-rate surprises are averaged out in the data, since we compute the average of government revenue over the years for which data are available and do not use point-in-time observations. Expectations of exchange-rate devaluations, in high-frequency data, would produce negative revenues from financial repression during the months preceding the devaluation (negative exchange-rate surprises; see José S. Lizondo, 1983) and positive revenues at the time of the devaluation (positive exchange-rate surprise). However, in a multiyear average, the negative and positive surprises should offset each other. Hence, if interest rates were not regulated (absence of financial repression) average data should show small revenues from financial repression. Finally, since we can look separately at interest-rate differentials and exchange-rate changes, we can evaluate the extent to which interest-rate differentials indicate the anticipations of devaluations (a signal of relatively free financial markets).

Table 1 contains the estimates of the average annual revenue from financial repression for each of the countries, computed over the years for which data are available. We measure this revenue both as a fraction of GDP and as a fraction of total central-government revenue, excluding the revenue from financial repression.

The table shows that revenue from financial repression has ranged from zero in

TABLE 1—THE SIZE OF REVENUE FROM FINANCIAL REPRESSION

Country	Sample	Revenue from financial repression	
		Percentage of GDP	Percentage of tax revenue
Algeria	1974–1987	4.30	11.42
Brazil	1983–1987	0.48	1.57
Colombia	1980–1984	0.24	2.11
Costa Rica	1972–1984	2.33	12.76
Greece	1974–1985	2.53	7.76
India	1980–1985	2.86	22.38
Indonesia	1976–1986	0.00	0.00
Jamaica	1980, 1982	1.38	4.74
Jordan	1978–1987	0.60	2.40
Korea	1975–1987	0.25	1.36
Malaysia	1974–1981	0.12	0.31
Mexico	1984–1987	5.77	39.65
Morocco	1977–1985	2.31	8.89
Pakistan	1982–1983	3.23	20.50
Panama	1977–1987	0.69	2.49
Papua New Guinea	1981–1987	0.40	1.90
Philippines	1975–1986	0.45	3.88
Portugal	1978–1986	2.22	6.93
Sri Lanka	1981–1983	3.40	19.24
Thailand	1976–1986	0.38	2.57
Tunisia	1978–1987	1.49	4.79
Turkey	1980–1987	2.20	10.89
Zaire	1974–1986 ^a	0.46	2.48
Zimbabwe	1981–1986	5.50	19.13

^aThe sample for Zaire does not include the years 1981, 1982, and 1983.

Indonesia, where domestic government debt is held exclusively by the central bank, to 6 percent of GDP in Mexico and Zimbabwe (in the case of Mexico, for which the sample is quite short, the effect of unanticipated exchange-rate changes probably plays an important role). In seven countries it exceeds 2 percent of GDP, and in five countries it exceeds 3 percent. The last column in the table indicates that financial repression has been as high as 40 percent of government revenue in Mexico and about 20 percent in India, Pakistan, Portugal, Sri Lanka, and Zimbabwe. Table 1 suggests that in many countries financial liberalization would generate a substantial budgetary problem and should be accompanied by a fiscal reform aimed at substituting for the revenue loss: the unweighted cross-country

average of government revenue from financial repression is about 2 percent of GDP and 9 percent of government revenue.¹⁶

An analysis of the geographical and time distribution of the data underlying Table 1 indicates a number of facts worthy of future research: financial repression appears to be more relevant in African countries (including North Africa) and least important in Asian countries. It is also much more evident in the recent years (1979–1987) than in the early part of the sample. This last phenomenon is associated with the growth of fiscal imbalances among LDC's in the 1980's.

The potential effects of financial liberalization can be gauged from Table 2, which reports the breakdown of ownership of domestic government debt. For completeness, the table includes central-bank holdings, even though those are not included in the calculation of the financial-repression tax base. The second column in the table includes holdings of deposit money banks only, a subset of domestic financial intermediaries. The table shows that, in the years for which we have data, on average 24 percent of total government domestic debt, and 37 percent of domestic debt in the hands of the public, is held by deposit money banks. The holdings of other financial institutions are included in the column labeled "other," but unfortunately these could not be singled out, for lack of data. Financial intermediaries, and among them deposit money banks, typically offset artificially low rates on their assets by paying low rates on their liabilities: savings and time deposits. This is an example of how the incidence of the financial-repression tax is shifted to households. In these cases the effect of financial liberalization is an increase in the cost of liabilities to financial intermediaries, since domestic residents can access higher-yielding portfolio investments elsewhere.

¹⁶On this topic, see, for example, Wayne R. Thirsk (1990). This conclusion is based on the assumption that the world rate of interest paid by the government on its foreign debt is exogenous, that is, the small-country assumption.

TABLE 2—DISTRIBUTION OF HOLDINGS
OF DOMESTIC GOVERNMENT DEBT
(PERCENTAGES)

Country	Sample	Central bank	Deposit money banks	Other
Algeria	1974–1987	18.7	56.2	25.1
Brazil	1983–1987	46.9	NA	53.1
Colombia	1980–1984	47.3	NA	52.7
Costa Rica	1972–1983	19.0	20.1	61.0
Greece	1974–1981	21.7	26.2	52.2
India	1980–1985	23.1	7.4	69.5
Indonesia	1976–1980	100.0	0.0	0.0
Jamaica	1980, 1982	60.3	14.1	25.7
Jordan	1978–1987	46.3	36.0	17.7
Korea	1975–1987	23.9	37.5	38.6
Malaysia	1974–1981	4.4	23.2	72.4
Mexico	1984–1987	53.7	19.1	27.2
Morocco	1977–1985	10.6	56.2	33.2
Pakistan	1982–1983	43.5	26.5	29.9
Panama	1977–1978	0.0	33.7	66.3
Papua New Guinea	1981–1987	18.3	49.6	32.1
Philippines	1975–1986	51.6	23.0	25.4
Portugal	1983–1986	46.9	10.7	42.4
Sri Lanka	1981–1983	32.4	20.2	47.4
Thailand	1976–1986	43.0	34.3	22.7
Tunisia	1978–1987	0.0	55.0	45.0
Turkey	1980–1987	40.3	NA	59.7
Zaire	1974–1986	92.8	6.8	0.4
Zimbabwe	1981–1986	16.8	18.4	64.8

Notes: Due to data limitations, the sample periods in this table do not always coincide with those of Table 1. When data on holdings of deposit money banks are not available separately, they are included in the “other” column.

In the absence of an increase in interest rates on government securities, financial intermediaries would thus risk bankruptcy and would possibly require public bailout. Hence the likely budgetary impact of financial liberalization could include either the cost of the bailout of these intermediaries or an increased cost of debt servicing, which would occur if government securities were mostly short-term.

Table 3 reports the two components of the revenue from financial repression: the interest-rate differentials and changes in exchange rates.¹⁷ The table highlights the im-

TABLE 3—THE FINANCIAL-REPRESSION TAX RATE
AND ITS COMPONENTS
(PERCENTAGES PER YEAR)

Country	Currency depreciation	Interest-rate differential	Tax rate
Algeria	1.59	8.49	10.08
Brazil	196.77	-183.32	13.45
Colombia	18.97	3.46	22.43
Costa Rica	20.9	4.21	25.11
Greece	14.29	1.65	15.94
India	7.38	3.43	10.81
Indonesia	11.6	11.67	23.27
Jamaica	0.47	6.85	7.32
Jordan	0.47	6.71	7.18
Korea	5.94	0.04	5.98
Malaysia	-0.64	2.40	1.76
Mexico	89.06	-43.25	45.81
Morocco	10.33	5.74	16.07
Pakistan	15.19	10.10	25.29
Panama	0.00	4.36	4.36
Papua New Guinea	4.66	0.90	5.56
Philippines	10.42	1.53	11.95
Portugal	17.36	-2.00	15.36
Sri Lanka	12.53	2.00	14.53
Thailand	2.45	1.84	4.29
Tunisia	7.22	5.98	13.2
Turkey	54.64	0.85	55.49
Zaire	56.29	6.00	62.29
Zimbabwe	17.8	2.50	20.3

Notes: Sample periods are as in Table 1. The column labeled “currency depreciation” reports the average annual increase in the price of the U.S. dollar in terms of the domestic currency, computed over the sample period. The column labeled “interest-rate differential” contains the average difference between the effective cost of foreign debt and the effective cost of domestic debt, expressed in dollars and domestic currency, respectively. It is also computed over the sample period. The last column (“tax rate”) is the sum of the previous two.

portance of financial-market restrictions. In the great majority of the countries in the table, despite the fact that the domestic currency has depreciated substantially relative to the dollar, the differential between the dollar interest rate on foreign liabilities and the domestic-currency interest rate on

the fact that in the majority of countries almost all foreign commercial debt is denominated in dollars. We verified this by looking at data on the currency of denomination of external debt from the World Bank DRS. Detailed data on the dollar-revaluation effect are available from the authors upon request.

¹⁷We do not report separate data on the dollar-revaluation effect since it is small for most years and for all countries if averaged over time. This is due to

domestic liabilities is positive and sizeable. The biggest exceptions, Brazil and Mexico, are two countries with very large currency depreciations and relatively short samples. In these cases too, however, higher domestic interest rates did not compensate for the realized exchange-rate devaluations. Except for Malaysia, the financial-repression tax rate always exceeds 4 percent.¹⁸

The evidence in Table 3 is suggestive of the way financial repression works in practice. Domestic interest-rate ceilings are maintained with high rates of currency depreciation and high domestic inflation. With free capital markets, this source of revenue would be limited, since expectations of exchange-rate changes would be reflected in the differential between domestic and foreign interest rates.

The relation between financial repression and seigniorage is illustrated in Figure 1 and Table 4. Figure 1 is a scatterplot of seigniorage against the revenue from financial repression. Following Fischer (1982), seigniorage is calculated as the change in high-powered money divided by GDP.¹⁹ The numbers in Figure 1 are the averages—over the same years as those covered in the calculation of the financial-repression revenue—of the revenue from seigniorage as a fraction of GDP. The ranges of values in the horizontal and vertical axes are quite comparable. The figure shows that the revenue from financial repression is, at least for half of the countries in the sample, of approximately the same size as the revenue from seigniorage. Table 4 contains two weighted-least-squares regressions of financial repression and seigniorage. Weighted least squares are appropriate because the time coverage of the averages for each country differ

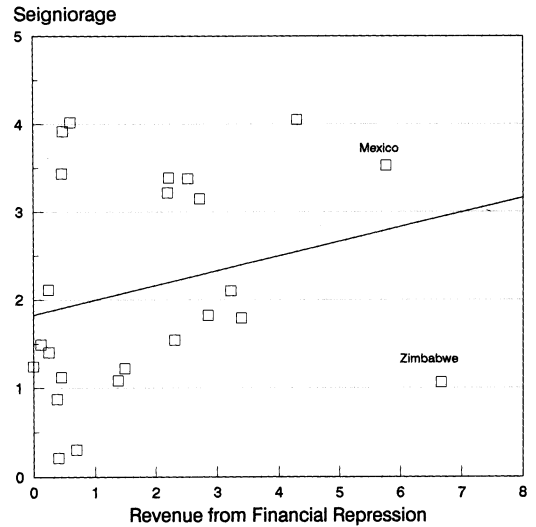


FIGURE 1. FINANCIAL-REPRESSION REVENUE AND SEIGNIORAGE (PERCENTAGES OF GDP)

TABLE 4—RELATION BETWEEN SEIGNIORAGE AND FINANCIAL REPRESSION (WEIGHTED-LEAST-SQUARES REGRESSION RESULTS)

Dependent variable	Constant	Independent variable
Financial repression	0.527 (2.211)	0.498 (5.271)
Seigniorage	1.652 (13.168)	0.332 (5.901)

Notes: Numbers in parentheses are *t* statistics; number of observations = 24. The dependent and independent variables are measured as percentages per year. Because individual countries' data are averages over samples of different length, we have weighted the variables pertaining to each country with the square root of the number of years over which each country's averages are computed; we then run ordinary-least-squares regressions using the weighted data.

widely, as indicated in Table 1. The table shows a positive and significant relation between financial repression and the inflation tax, suggesting the presence of the complementarity discussed above in Section I.

IV. Summary and Concluding Remarks

This paper has presented an exploratory analysis of the empirical relevance of financial repression from a public-finance perspective. While financial repression should

¹⁸In the majority of countries, the time-variation of exchange-rate changes accounts for most of the time-variation of the gains from financial repression. This is confirmed by the decomposition of the variance (over the sample for each country) of financial repression: on average the variance of the exchange-rate component is three times the variance of the interest-differential component. The results of this variance decomposition are available on request.

¹⁹High-powered money is from the IMF's *International Financial Studies*, line 14.

not be resorted to when countries face no constraints in the use of different forms of taxation, whenever there are costs of administering certain types of taxes, or whenever income distribution becomes an objective of the government, an implicit tax on domestic financial markets may be part of an optimal taxation program.

The evidence indicates that the revenue from financial repression can be quite substantial: the unweighted cross-country average is about 2 percent of GDP and 9 percent of total government revenue (excluding the revenue from financial repression) but varies significantly across countries. Hence, reforms aimed at liberalizing financial markets and removing capital controls should first identify the size of the government revenue from financial repression and provide for the revenue shortfall the government will experience as a result of the liberalization.

For many countries, government revenue from financial repression is of the same order of magnitude as the revenue from seigniorage, as estimated by Fischer (1982). Moreover, there is evidence of some complementarity between seigniorage and financial repression: in general, countries with higher rates of inflation and, therefore, higher rates of currency depreciation tend to raise more revenue from financial repression.

In our view, this *prima facie* evidence on the quantitative importance of financial repression opens important questions for research and policy-making. First, it would be useful to carry out a theoretical assessment and empirical estimation, based on general-equilibrium analysis, of the resulting production distortions. Second, from the policymakers' viewpoint, it is important to identify, at the country level, those reforms of tax systems that would replace financial repression with more efficient means of raising revenue.

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