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Seigniorage and the Case for a National Money

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In countries with high rates of inflation there is typically movement away from the use of the local currency. The paper analyzes the costs and benefits of using a local currency, with emphasis on the seigniorage forgone by using a foreign money. Even if it should be desirable for a country to fix its exchange rate, it still loses seigniorage if it does not use its own money. The case for using a foreign money then turns largely on the superior discipline imposed on domestic policymakers by removing their control over the money supply. Alternative methods of imposing discipline are discussed. Estimates of the amount of seigniorage raised by different governments are presented; seigniorage amounts in some cases to about 10 percent of government revenue. Estimates are also presented of both the annual flow and one-time stock costs of giving up use of domestic currencies and instead using the dollar. The flow cost is typically about 1 percent of GNP and the stock cost is around 10 percent of GNP.

As a country's inflation rate increases, there is typically a shift away from the domestic money toward a foreign money—as store of value, as unit of account, and as medium of transactions. This process is known as dollarization.¹

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¹ Dollarization should be understood to apply generally to the increasing use of any

Dollarization is one means of reducing the economically relevant inflation rate.² But in the limit it leads to the replacement of the domestic by a foreign money. The question it raises then, and the question analyzed in this paper, is whether a country should use a national or a foreign money. Equivalently, the question is whether dollarization should be opposed on national economic grounds. The issue is clearly related to those of the choice between fixed and floating exchange rates, of fiat versus commodity money, the optimum currency area, currency substitution, the rationale for monetary policy, and the optimal inflation tax.

The emphasis in this paper is on seigniorage and the optimal inflation tax. The argument is simple. I assume throughout that there is a single foreign country against which the domestic country will have either a fixed or a floating exchange rate. To start with, assume there are no costs of exchanging domestic for foreign money in international transactions. Then a rational, self-controlled government would not use a foreign money. Such a government would decide, on the basis of an analysis familiar from the optimum currency area³ and optimal exchange-rate regime literatures, whether it should have a fixed or floating exchange rate. If the floating-rate regime is optimal, the country will perforce use its own money. If it is optimal to have a fixed exchange rate, it should still use its own money to avoid paying seigniorage to the foreign country.⁴

Two factors could overturn this basic argument for using a national money. First, the transaction costs of exchanging domestic for foreign money could make use of a foreign money optimal. Such costs are a function of the proportion of transactions conducted with users of foreign monies and would be largest for small open economies. Second, a government that could not control itself might want the discipline of using a foreign money.

The paper proceeds as follows. In Section I, I describe the type of institutional arrangements that might exist in a country—such as Panama—using a foreign money. Section II discusses the basic factors which determine the desirability of the choice of a domestic, rather than foreign, money. Seigniorage is the most important factor. Sec-

foreign money. However, in this paper I shall, for convenience, conduct the discussion with explicit reference to use of the dollar. Mexican experience of dollarization is described in Ortiz and Solis (1979).

² During the process of, and partly resulting from, dollarization, the price level measured in terms of domestic currency will be rising rapidly. However, the economic significance of the inflation rate measured in local prices is reduced because the domestic money is in part replaced by the foreign money.

³ See Tower and Willett 1976.

⁴ Birnbaum (1957) contains an interesting discussion of the benefits of using a national money.

tion III presents data on the use of seigniorage by a cross-section of countries for the past two decades, showing that the creation of high-powered money has been an important source of revenue for the governments of several LDCs. Section IV estimates the amount of seigniorage other countries would pay to the United States if they switched to use of the dollar. In Section V, I consider methods for reducing the costs to the domestic country of using a foreign money. Concluding remarks are contained in Section VI.

I. Institutional Arrangements Using a Foreign Money

Under the gold standard, each country in essence uses a foreign money.⁵ But even in recent years, some countries, of which Panama is the most-quoted example, have used the monies of others.⁶ The arrangements briefly described in this section are, thus, not imaginary.

Four features of the economy which uses a foreign money are taken up in turn: government finance, the balance of payments, the banking system, and economic policy.

The government finances itself by taxes and by borrowing; indeed there is no essential difference between its budgetary and financing processes and those of state and local governments in the United States. The only taxing power the government gives up is seigniorage. It might be argued that the right to print money is peculiarly important in providing a government with a ready source of finance in an emergency, as evidenced by wartime suspensions of the gold standard. However, the government that does not have access to the printing press can, nonetheless, use emergency taxes or compulsory loans for emergency financing.

The country, of course, has a current and capital account in the balance of payments. It has, on average, to run a balance of payments surplus to import the high-powered money needed for domestic use. The size of the required surplus depends on the nature of the banking system. Domestic banks would hold dollar assets and issue dollar liabilities, and dollars would be used as currency. There should be a

⁵ This applies also to the gold-producing countries, which use real resources to obtain their high-powered money. Such countries might be better off under the gold standard than in a fiat money system, even though at the world level the switch from a commodity to fiat money is potentially Pareto improving.

⁶ The British Currency Board system did not require the use of sterling as the domestic currency for the colonies but generally required 100 percent backing of the local currency. The reserves could be held in interest-bearing form (see Shannon 1951, 1952; Newlyn and Rowan 1954). Negotiations over the creation of, and distribution of, seigniorage in the Rand monetary area are described in Collings et al. (1978).

strong incentive for the banking system to operate efficiently, treating high-powered money as a scarce resource.

It is essentially a semantic question as to whether the country could be described as having a central bank. There would likely be an institution that controls the banking system, and also one that manages the cash holdings of the government. These tasks could be combined in a monetary authority or central bank which would not, though, have the power to issue high-powered money. The central bank might require banks' reserves to be deposited with it for reinvestment in interest-bearing form. The central bank might also want to hold interest-bearing precautionary reserves.⁷

Economic policy goals of the government could be achieved through fiscal policy. Suppose the government has policy goals which are related to the current account of the balance of payments, the level of employment, the real wage, and the rate of investment. Tariffs and subsidies or excise taxes affect the terms of trade and the current account. Wage subsidies and government purchases can affect the level of employment and real wages. Investment subsidies affect the rate of investment. The country does not have to allow the world interest rate to determine the domestic cost of capital and rate of return to saving: By imposing taxes or subsidies on interest, it can determine the rates of interest relevant for domestic investment and saving.⁸ Of course, these allocative fiscal policy actions cannot be used to attain arbitrary levels of the target variables, which is only to say that resources are scarce.

In brief, there is nothing especially exotic about an economy that does not use its own money.

II. Basic Considerations

Three situations should be distinguished: (a) a floating-rate regime; (b) a fixed exchange-rate regime, in which the exchange rate is taken to be fixed for all time, but the country uses a domestic money; (c) a regime that uses a foreign money. Intermediate cases, such as the adjustable or floating peg, are subsumed under category (a).

In the first case, the government collects seigniorage, can determine its own inflation rate and optimal rate of seigniorage collection, and has the potential for using countercyclical monetary policy. In case

⁷ Much of small open-economy fixed exchange-rate macroeconomics can be understood by asking what effect an open market operation—in which the government sells its own dollar-denominated, interest-bearing liabilities—would have on interest rates or the stock of money.

⁸ I assume the government's ability to monitor and tax international flows of goods and capital is independent of exchange arrangements.

(*b*), the fixed-rate regime, the country collects seigniorage, but at a rate that is determined by the foreign country's inflation rate. I defer until Section V the question of whether a permanently fixed exchange-rate regime is possible if a country uses its own money. In case (*c*), the country in effect has a fixed exchange rate but elects to pay seigniorage to the foreign country.

The basic argument is simple. The choice between (*a*) and (*b*), fixed and floating exchange rates, is made on the basis of a cost-benefit analysis in which the loss of control over the country's rate of seigniorage collection and domestic policy instruments that have to be directed to maintenance of a fixed exchange rate are balanced against the benefits of having a fixed exchange rate. If the analysis ends in favor of floating rates, a domestic money has to be used. If the comparison between (*a*) and (*b*) ends in favor of fixed rates, a domestic money should still be used, because use of a foreign money requires the payment of seigniorage to foreigners.

Two factors argue in favor of use of a foreign money. First, additional costs of exchanging currencies are incurred when a domestic money is used and not incurred when a foreign money is used. The saving on these costs is to be compared with the costs of the seigniorage transfer to the foreign country. The saving in transaction costs would be a function of the number and value of transactions carried out with foreigners and, therefore, of the openness of the economy. For a very open economy, transaction costs could outweigh seigniorage costs and tilt the balance toward use of a foreign money.⁹

The second argument for using a foreign, rather than domestic, money is discipline. Rates of inflation in countries undergoing the process of dollarization appear to be well above optimal rates. The policy authorities in such countries have lost their grip on their instruments. Commitment to fixed exchange rates would provide some discipline for such policy makers.¹⁰ Alternatively, there might in some countries be a constitutional means of imposing discipline on policy makers, though constitutional solutions are not credibly available in most countries.

It is necessary to ask how discipline is enforced in a fixed-rate regime. How, in other words, does the system ensure that the exchange rate remains fixed rather than becoming an adjustable peg? Insofar as the difficulty of maintaining fixity of the exchange rate

⁹ It has been suggested that access to foreign capital markets is easier for a country that does not use its own money. To the extent this is true—and given the volume of foreign currency borrowing by banks in small countries it is not obviously a major factor—the higher interest costs are a transaction cost of using a domestic currency.

¹⁰ There is obviously no guarantee, however, that the foreign government will not mismanage its currency.

stems from the possibility of balance of payments crises, fixity of the exchange rate could be preserved by holding at least 100 percent reserves. If such reserves were maintained, there would be no risk that the monetary authority could not meet demands for foreign money. Further, since reserves can be borrowed and reinvested, the costs of keeping 100 percent reserves would be small. However, there is still implicitly an assumption that the government will stick by the rules of the game and not run down foreign assets in an emergency, when economic rationality almost certainly would argue that it should. This is of course the problem of dynamic inconsistency of optimal policy analyzed by Kydland and Prescott (1977).

The argument for use of a foreign money would then be that it makes it that much harder for the monetary authority to misuse the reserves, which in this case are largely under the control of the private sector. But even here there is a problem: The outstanding stock of foreign money is a tempting seigniorage prize for domestic policy makers contemplating the introduction of a domestic money.¹¹ That part of the money stock in the form of currency may be difficult to collect, though some no doubt will be collectible.

There is no absolutely guaranteed way of providing discipline for governments determined to avoid it. But the discipline imposed by use of a foreign money is greater than that imposed by fixity of the exchange rate, which is greater than that imposed under a flexible-rate system. This is, therefore, a serious argument for use of a foreign money.

III. Recent Use of Seigniorage

Is seigniorage large enough to justify the emphasis placed on it in the previous section? In this section I present evidence which shows that several governments have made substantial use of seigniorage in the last two decades and, therefore, that the concentration of this paper on that issue is well directed.¹²

The basic data are contained in tables A1 and A2 in the Appendix. For each country, for each period, the ratio of the change in high-powered money¹³ to nominal GNP is calculated. This represents the

¹¹ Similar comments would apply to the temptation of running down reserves in a 100 percent reserve scheme.

¹² Rates of seigniorage use by countries obviously vary greatly. Differences in tastes and technologies between countries would produce variation in the optimal rate of seigniorage. In addition the efficiency of different methods of raising taxes is likely to help account for international differences in rates of seigniorage. The state of development of the banking system likewise affects the optimal rate of seigniorage.

¹³ This is the change in "Reserve Money," line 14 in the IMF's *International Financial Statistics*.

command over resources, as a ratio to GNP, that the government obtained in that year by creating high-powered money. To the extent that high-powered money is backed by foreign currency reserves—as it is for some countries—the assumption is that the reserves are invested in interest-bearing assets and do not represent any offset to the seigniorage effects of creating high-powered money.¹⁴ Also shown in the tables of the Appendix is the ratio, for each country, of seigniorage use to total government revenue (including seigniorage).

The data are summarized in tables 1 and 2 in the text. Each table shows the (unweighted) average rate of seigniorage use by the countries in each group, as defined by the IMF. Data for those countries whose rate of seigniorage use on average exceeded 2 percent of GNP are also included in the tables. The rate of high-powered money creation relative to GNP is typically greater for LDCs than for higher-income countries, and in some cases is even above 5 percent on average over more than a decade. Correspondingly, there are governments for which seigniorage constitutes over 10 percent of total revenue on average. Seigniorage is thus not a minor factor for these governments.

The data on growth rates of real output and prices in the tables are presented to show that there are basically two types of situations in which seigniorage use is high—these are cases of “active” and “passive” seigniorage. Seigniorage use is active in the high-inflation countries, such as Argentina, Uruguay, Chile, and Brazil. It is passive in the rapidly growing countries, such as many members of OPEC. In the passive case, seigniorage is obtained by providing high-powered money to meet the rapidly growing demand, without necessarily having high inflation.

IV. Seigniorage Payments for Use of the Dollar

A. *The Annual Flow of Seigniorage*

The data in table 3 are estimates of the flow rate at which seigniorage, relative to GNP, would have been paid to the United States by other

¹⁴ There is an important issue here. If a country is required to have net foreign assets to back the currency, then it cannot borrow to acquire reserves. Under such circumstances, there is a constraint on the time paths of foreign indebtedness open to the country and, therefore, a loss from the reserve requirement if, as would normally be the case, such a country would optimally want to be a debtor. Put differently, such a country could be constrained to run a current-account surplus at a time when it would more sensibly be running a current-account deficit. As noted earlier, in the British Currency Board system, reserves were held in interest-bearing form. Whether this requirement is a burden depends on whether the country is allowed to borrow to acquire reserves (leaving aside transaction and interest-differential costs).

TABLE I
SEIGNIORAGE RATES FOR SELECTED COUNTRIES, 1960-73 AND 1973-78

	AVERAGE OF (CHANGE IN <i>H</i> DIVIDED BY (CHANGE IN <i>H</i> PLUS GOVERNMENT REVENUE))		AVERAGE RATE OF INFLATION		AVERAGE RATE OF GROWTH OF REAL GNP	
	1960-73	1973-78	1960-73	1973-78	1960-73	1973-78
Industrial countries:						
Italy	.010	.011	.061	.059	.043	.095
Switzerland	.020	.039	...	...	...	...
Other Europe:	.021	.014	...	...	...	...
Greece	.019	.023	.083	.104	.070	.160
Iceland	.020	.030	...	...	...	...
Portugal	.022	.028	...	...	...	...
	.021	.043	...	...	...	...

NOTE.—In any row, averages are based on data for the same countries. Averages are not necessarily for the same years as shown in table A1.

SEIGNIORAGE RATES FOR SELECTED COUNTRIES

	Average of H (Change in H Divided by GNP)	Average of [(Change in H Divided by (Change in H Plus Government Revenue)]	Average Rate of Inflation	Average Rate of Growth of Real GNP
Oil-exporting countries:		.089	...	...
Algeria	.021		...	...
Indonesia	.023		...	...
Libya	.034		...	...
Oman	.030		...	...
Saudi Arabia	.032		...	...
Other Western Hemisphere:	.022	.133	.194	.05
Argentina	.062		...	...
Brazil	.032		...	...
Chile	.055		...	...
Peru	.026		...	...
Uruguay	.048		...	...
Other Middle East:	.038	.130	...	...
Cyprus	.022		...	...
Egypt	.027		...	...
Israel	.024		...	...
Jordan	.051		...	...
Lebanon	.027		...	...
Syria	.028		...	...
Yemen AR	.108		...	...
Other Asia:	.014	.095	.071	.06
Republic of China	.022		...	...
Korea	.022		...	...
Singapore	.025		...	...
Papua New Guinea	.026		...	...
Other Africa:	.013	.070	...	...
Gambia	.021		...	...
Rwanda	.021		...	...
Zaire	.034		...	...

NOTE.—For most countries, calculation is for years 1960–78 or 1960–77; actual years are shown in table A2. In any row, averages are based on data for the same countries. Averages are not necessarily for the same years as shown in table A2.

TABLE 3
SEIGNIORAGE LOST (RELATIVE TO GNP) BY USING THE U.S. DOLLAR

Countries	Assumption I	Assumption II
Industrial countries	.0074	.0068
Other Europe	.0102	.0086
Australia, New Zealand, South Africa	.0037	.0027
Oil-exporting countries	.0096	.0064
Other Western Hemisphere	.0057	.0043
Other Middle East	.0177	.0120
Other Asia	.0091	.0064
Other Africa	.0076	.0057

NOTE.—Figures given are averages.

countries if they used the dollar. The calculations are based on the following formula:

$$\frac{\text{seigniorage}}{\text{GNP}} = \frac{\dot{C}}{Y} = \frac{\dot{C}}{C} \frac{C}{Y} = \left(\eta_y \frac{\dot{y}}{y} + \eta_p \frac{\dot{P}}{P} \right) \frac{C}{Y}, \quad (1)$$

where η_y is the real income elasticity of the demand for currency, and η_p is the price elasticity, assumed equal to one, of currency demand. The data in table 3 are estimates of the seigniorage cost of moving from fixed exchange rates to use of a foreign money.¹⁵

The following assumptions, chosen to provide conservative (low) estimates of the seigniorage flow, underlie (1). First, bank reserves would be held in interest-bearing form, perhaps by the central bank so that there would be no seigniorage costs attached to that component of what are currently holdings of high-powered money. I thus assume that seigniorage would be paid only for the use of currency. Second, table 3 shows calculations based on two alternative estimates of the income elasticity of the demand for currency: In the first column it is assumed that the income elasticity is one and in the second column that it is one-half. The growth rate of income in each case is that of the country for the periods shown in tables A1 and A2. Third, the inflation rate is the same as the average U.S. inflation rate (CPI) over the indicated period. Fourth, the currency/GNP ratio is the average in that country for the period shown. Fifth, no account is taken of the inflation elasticity of the demand for currency. Since most countries experienced more inflation than the United States over the period, the currency/GNP ratio would be higher for most countries if elasticity of currency demand to expected inflation were taken into account.

¹⁵ Data for individual countries underlying tables 3 and 4 are available on request from the author.

TABLE 4

COST OF ACQUIRING THE INITIAL STOCK OF FOREIGN HIGH-POWERED MONEY, MEASURED AS CURRENCY/GNP, 1976

Industrial countries	.073
Other Europe	.090
Australia, New Zealand, South Africa	.036
Oil-exporting countries	.084
Other Western countries	.056
Other Middle East	.198
Other Asia	.075
Other Africa	.088

Table 3 shows that the amounts of resources involved are not trivial for most countries; orders of magnitude of seigniorage flow of .75 percent to 1 percent of GNP are common. The ratios are higher for LDCs, presumably because their banking systems are less well developed, and the currency/GNP ratio is therefore higher in those countries.

B. The Costs of Acquiring the Initial Stock of Currency

A country giving up use of its own currency faces a one-time cost of acquiring the initial stock of foreign high-powered money. Under the assumptions made in subsection *A*, this cost, relative to 1 year's GNP, would be the currency/GNP ratio. The relevant ratios are presented in table 4 based on the currency/income ratio in 1976. The average is about 8 percent of GNP. The transition cost appears to be prohibitive.

The data in table 4 are not only estimates of the costs of switching over to use of a foreign currency. They also show the size of the maximum seigniorage gain or temptation for a government that decides to issue a domestic currency in exchange for the foreign currency.¹⁶

V. Could the Costs of Using a Foreign Money Be Reduced?

Is there some way of reducing the seigniorage costs for the domestic country from the levels shown in tables 3 and 4? Since the dollars are costless to produce, there would be no loss for the United States in providing the high-powered money at no cost. However, it is difficult to believe that these resources would be provided at zero cost to the

¹⁶ In this context one sees clearly the point made by Auernheimer (1974) in discussing government revenue from inflation: There may be a stock gain to the government from a change in regime as well as a change in rates of flow.

countries which use them.¹⁷ Further, foreign countries would not want to be dependent on what looks like the United States's largesse for provision of their monetary base.

Domestic steps could be taken to reduce the demand for high-powered money. As already noted, bank reserves could be held by the central bank in interest-bearing form. Development of the banking system as a means of reducing the demand for currency could be encouraged, for instance, by providing incentives for payment of wages into bank accounts.

Similarly, it might be possible to introduce a domestic currency, exchangeable at par with the dollar, and allowed to circulate simultaneously with the dollar. Such an arrangement exists in Swaziland, in Bermuda, and no doubt in other countries. The trick here is to find some epsilon of friction that makes the domestic currency more attractive to hold than the dollar, at least for domestic residents. For instance, payments for certain classes of transactions might have to be made in the domestic currency.

However, all arrangements to reduce the domestic demand for foreign money, while in principle continuing to use it, run the danger of decoupling the domestic from the foreign money. The analogy here is with the comparison between the gold standard and the gold-exchange standard.

Use of a foreign money does not, in principle, necessarily prevent the domestic government from taxing money holding. In principle, average holdings of currency and bank deposits could be taxed. Given the difficulty of imposing taxes on currency, it would likely be optimal to tax neither form of money holding. Taxing average holdings of bank deposits would encourage the holding of currency at the expense of deposits.

The conclusion is that the costs of using a foreign money can be reduced relative to monetary arrangements in most countries. But introduction or use of a domestic money will still be cheaper than use of a foreign money.

VI. Concluding Comments

This paper has shown that there are substantial costs to using a foreign money and that dollarization is, therefore, not a development to be welcomed from the viewpoint of a single nation's interests. These costs are the seigniorage costs that would be paid to a foreign

¹⁷ Collings et al. (1978) describe the distribution of seigniorage in the Rand monetary area: Even in that case, Botswana elected to introduce its own money, and Swaziland has its own currency circulating jointly and at par with the Rand, holding 100 percent reserves against the domestic currency.

country to import high-powered money, plus the excess welfare burden incurred by giving up independent control over the domestic rate of high-powered money creation.

However, in those countries where dollarization is observed, it is usually the response to a government out of control rather than one setting the inflation rate on the basis of a careful optimizing analysis. Under such circumstances, use of a foreign money appears to provide a useful discipline on the monetary authority. But the system carries the seeds of its own destruction, since the value of the outstanding stock of currency is a seigniorage incentive to the government which introduces a domestic currency. Use of a foreign money also implies that the domestic government is relying on the foreign government to maintain better control over the inflation rate than it does itself—an admission that most governments would be reluctant to make. And besides, Who is to guard the guardians?

APPENDIX

TABLE A1

SEIGNIORAGE RATES FOR SELECTED COUNTRIES, 1960-73 AND 1973-78

	AVERAGE OF (CHANGE IN H DIVIDED BY GNP)		AVERAGE OF [CHANGE IN H DIVIDED BY (CHANGE IN H PLUS GOVERNMENT REVENUE)]		AVERAGE RATE OF INFLATION		AVERAGE RATE OF GROWTH OF REAL GNP	
	1960-73	1973-78	1960-73	1973-78	1960-73	1973-78	1960-73	1973-78
Industrial countries:								
United States	.004	.005	.021	.027	3.18	7.97	.04	.08
Canada	.005	.007	.027	.034	3.27	9.22	.06	.03
Japan	.014	.012	.107	.129	6.12	11.26	.10	.04
Austria	.011	.010	.050	.047	4.17	6.86	.05	.03
Belgium	.010	.009	.043	.035	3.60	9.20	.05	.02
Denmark	.004	.003	N.A.	N.A.	6.18	10.97	.05	.02
France	.012	.003	.051	.010	4.57	10.69	.06	.03
Germany	.009	.007	.063	.048	3.33	4.72	.05	.02
Italy	.020	.039	.098	.160	4.66	16.38	.05	.02
Netherlands	.006	.006	N.A.	N.A.	4.89	7.85	.05	.02
Norway	.006	.010	N.A.	N.A.	5.05	9.49	.05	.05
Sweden	.005	.009	N.A.	N.A.	4.65	10.26	.04	.01
Switzerland	.021	.014	N.A.	N.A.	4.24	4.04	.04	-.01
United Kingdom	.006	.010	.019	.028	5.00	16.07	.03	.01
Average	.010	.010	.057	.058	4.49	9.64	.05	.02
Other Europe:								
Finland	.003	.003	.012	.012	5.70	13.74	.05	.01
Greece	.020	.030	.103	.135	3.29	15.52	.08	.04
Iceland	.022	.028	N.A.	N.A.	11.86	39.29	.06	.03
Ireland	.017	.027	.061	.079	5.87	15.34	.04	N.A.
Portugal	.021	.043	N.A.	N.A.	6.12	21.63	.07	.02
Spain	.017	N.A.	N.A.	.156	6.92	18.33	.08	.03
Turkey	.019	.037	N.A.	N.A.	N.A.	24.52	.06	.06
Yugoslavia	N.A.	N.A.	.113	N.A.	13.35	16.89	.07	.06
Average	.017	.028	.072	.096	6.94	19.05	.06	.04

TABLE A2
SEIGNIORAGE RATES FOR SELECTED COUNTRIES

	Period	Average of H (Change in H Divided by GNP)	Average of (Change in H Divided by (Change in H Plus Government Revenue))	Average Rate of Inflation	Average Rate of Growth of Real GNP
Miscellaneous countries:					
Australia	60-78	.006	.024	6.00	.04
New Zealand	60-78	.003	.006	7.25	.04
South Africa	60-78	.005	.028	5.87	.05
Average		.005	.019	6.37	.04
Oil-exporting countries:					
Algeria	65-77	.036	.088	7.77	N.A.
Indonesia	66-78	.023	.113	32.14	.06
Iran	60-77	.019	.085	6.19	.09
Iraq	60-76	.019	N.A.	4.25	.07
Kuwait	62-76	.007	N.A.	8.86	N.A.
Libya	60-77	.034	N.A.	4.77	N.A.
Nigeria	60-77	.014	.072	9.67	N.A.
Oman	71-77	.030	N.A.	N.A.	N.A.
Qatar	...	N.A.	.013	N.A.	N.A.
Saudi Arabia	62-78	.032	N.A.	8.45	.11
Venezuela	60-78	.011	.034	3.34	.06
Average		.023	.068	9.49	.08
Other Western Hemisphere:					
Argentina	60-75	.062	.459	57.22	.03
Bolivia	60-78	.017	N.A.	9.86	.06
Brazil	60-78	.032	N.A.	36.47	.09
Chile	60-77	.055	.183	88.95	.03

TABLE A2 (Continued)

	Period	Average of (Change in <i>H</i> Divided by GNP)	Average of (Change in <i>H</i> Divided by Plus Government Revenue)	Average Rate of Inflation	Average Rate of Growth of Real GNP
Colombia	60-78	.018	.167	14.96	.06
Costa Rica	60-78	.018	N.A.	5.73	.06
Dominican Republic	60-77	.012	.053	5.38	.07
Ecuador	60-78	.018	.130	8.03	.07
El Salvador	60-78	.013	.086	4.44	.05
Guatemala	60-77	.011	.092	4.45	.06
Haiti	66-78	.012	.107	5.72	.02
Honduras	60-78	.009	.062	4.03	.05
Mexico	60-78	.016	N.A.	8.00	.06
Nicaragua	60-78	.009	N.A.	6.21	.05
Panama	....	N.A.	N.A.	3.38	.06
Paraguay	60-78	.015	.132	6.30	.06
Peru	60-78	.026	.092	15.22	.04
Uruguay	60-78	.048	.284	51.71	.01
Bahamas	....	N.A.	.002	6.54	N.A.
Barbados	67-78	.014	.029	11.51	N.A.
Grenada	....	N.A.	N.A.	N.A.	N.A.
Guyana	60-77	.012	.032	5.10	.03
Jamaica	60-78	.011	.052	9.00	.03
Netherland Antilles	....	N.A.	N.A.	4.34	N.A.
Surinam	68-75	.015	N.A.	6.09	N.A.
Trinidad and Tobago	60-78	.009	.021	7.03	.04
Average		.020	.117	15.43	.05
Other Middle East:					
Bahrain	....	N.A.	N.A.	9.93	N.A.
Cyprus	60-78	.022	N.A.	3.66	N.A.

Egypt	.027	N.A.	5.25	N.A.
Israel	.024	.063	15.60	.08
Jordan	.051	.196	10.35	N.A.
Lebanon	.027	N.A.	N.A.	N.A.
Syria	.028	N.A.	5.62	.08
Yemen AR	.108	N.A.	26.54	N.A.
Yemen PDR	N.A.	.201	9.32	N.A.
Average	.041	.153	10.78	.08
Other Asia:				
Afghanistan	N.A.	N.A.	N.A.	N.A.
Bangladesh	N.A.	N.A.	11.33	N.A.
Burma	N.A.	N.A.	7.10	.03
Republic of China	.022	N.A.	6.04	.09
India	.010	N.A.	6.83	.04
Korea	.022	.127	13.78	.09
Malaysia	.012	.051	3.18	N.A.
Nepal	.010	.173	6.98	.02
Pakistan	.014	.106	7.61	.05
Philippines	.008	.056	8.43	.06
Singapore	.025	.083	3.78	.09
Sri Lanka	.011	.043	4.48	.05
Thailand	.010	N.A.	4.59	.08
Fiji	.017	N.A.	8.67	N.A.
Papua New Guinea	.026	N.A.	9.29	.05
Western Samoa	N.A.	N.A.	7.08	N.A.
Average	.016	.093	7.28	.06
Other Africa:				
Benin	N.A.	N.A.	N.A.	N.A.
Burundi	N.A.	.070	7.17	N.A.
Cameroon	N.A.	N.A.	7.15	N.A.
CAE	N.A.	N.A.	7.49	N.A.
Chad	N.A.	N.A.	5.99	N.A.
Congo	N.A.	N.A.	6.07	N.A.
Ethiopia	.010	.091	6.47	.04
Gabon	N.A.	N.A.	7.68	N.A.

TABLE A2 (Continued)

	Period	Average of (Change in <i>H</i> Divided by GNP)	Average of (Change in <i>H</i> Divided by Plus Government Revenue)	Average Rate of Inflation	Average Rate of Growth of Real GNP
Gambia	65-78	.021	.072	5.88	N.A.
Ghana	60-74	.013	.107	20.14	.03
Ivory Coast	63-77	.015	N.A.	7.06	N.A.
Kenya	67-78	.013	.071	6.35	N.A.
Liberia	...	N.A.	N.A.	7.31	.01
Madagascar	63-73	.005	N.A.	5.44	N.A.
Malawi	66-78	.008	.030	7.44	.06
Mali	...	N.A.	N.A.	N.A.	N.A.
Mauritania	...	N.A.	N.A.	7.28	N.A.
Mauritius	60-77	.018	N.A.	7.28	N.A.
Morocco	60-78	.015	N.A.	4.88	.06
Niger	...	N.A.	N.A.	7.78	N.A.
Rwanda	65-77	.021	N.A.	9.02	N.A.
Senegal	63-78	.005	N.A.	5.31	N.A.
Sierra Leone	64-78	.010	N.A.	6.56	N.A.
Somalia	...	N.A.	N.A.	6.44	N.A.
Sudan	60-75	.012	N.A.	8.17	N.A.
Tanzania	67-78	.013	N.A.	11.83	.05
Togo	63-72	.006	N.A.	6.14	N.A.
Tunisia	60-78	.012	N.A.	3.99	.07
Upper Volta	...	N.A.	N.A.	6.40	N.A.
Zaire	64-77	.034	N.A.	28.35	.06
Zambia	66-78	.011	.039	7.29	.04
Uganda	...	N.A.	N.A.	16.81	N.A.
Average		.013	.069	8.37	.05

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