

An Incentive-Compatible Suggestion for Seigniorage Sharing with Dollarizing Countries

by Owen F. Humpage

Sixteen countries now give the U.S. dollar legal-tender status. Although dollarizing can help emerging-market countries gain monetary credibility and avoid currency crisis, many do not want to give up the seigniorage revenues associated with issuing their own fiat currency. This article offers a proposal for seigniorage sharing.

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ISSN 1528-4344

Author's Note: The past few years have witnessed a growing debate about the merits of dollarization. Although most of the work has focused on theoretical macroeconomic issues, a few proponents have recommended that the United States support dollarization by sharing the seigniorage that it acquires from the foreign use of the dollar. This paper offers a proposal for seigniorage sharing.

The ideas expressed in this paper are presented solely as an academic exercise to foster further discussion of dollarization. The ideas do not represent the views of the Federal Reserve Bank of Cleveland or of the Board of Governors of the Federal Reserve System. Neither institution has taken a position on dollarization. The decision on whether to share seigniorage does not fall within the purview of the Federal Reserve System. It is, rather, a decision to be made by elected officials in the U.S. government. The Federal Reserve System operates within the range of authority given to it by the U.S. Congress as expressed in the Federal Reserve Act. The System does not currently have authority to engage in seigniorage sharing and would not undertake any form of seigniorage sharing unless directed to do so by Congress.

Introduction

In January 1999, Argentina's President Carlos Menem recommended that his country officially dollarize—replace the peso with the U.S. dollar. His proposal stirred interest throughout the Americas. Ecuador officially dollarized in 2000, and El Salvador and Guatemala followed suit early last year. In all, 16 countries are now officially dollarized.^{1,2}

For many Latin American countries, however, official dollarization amounts to little more than the legal recognition of a situation that has existed since the 1970s, one that is now quite advanced and, perhaps, irreversible in several places. The residents of many Latin American countries already denominate a significant share of their assets and liabilities in U.S. dollars and often use dollars to set prices and to settle current transactions, despite the dollar's lack of legal-tender status in their countries. These dollar holders have completed a cost-benefit analysis and have acted in their individual best interests. Some of their governments, however, resist dollarization—official or unofficial—primarily because a country that dollarizes loses seigniorage to the United States and because, as Sims (2001) suggests, the option to generate surprise inflation has value to them.

This *Policy Discussion Paper* discusses an incentive-compatible proposal for returning seigniorage to officially dollarizing countries, under which the U.S. Treasury would purchase dollar-denominated, zero-coupon bonds at face value from the governments of dollarizing countries that undertake sound budgetary practices and that liberalize their financial markets. Assuming that Congress directs the Federal Reserve to participate, the U.S. Treasury would then monetize these purchases by selling special certificates to the central bank. The Federal Open Market Committee would set overall limitations on the amounts of these special certificates that the System holds, and the Open Market Desk would sterilize any undesired monetary-base changes resulting from their acquisition.

As prelude to the presentation of this proposal, I first explain the factors that have encouraged unofficial dollarization and the problems that partial, unofficial dollarization creates. Next I define official dollarization, explain seigniorage, and present some rough estimates of seigniorage for a set of Latin American countries. Then I present a proposal for seigniorage sharing and compare it with plans offered by the Joint Economic Committee and by Harvard economist Robert Barro. I conclude by briefly addressing some traditional optimal-currency-area concerns about dollarization. Dollarization may not be desirable for all emerging-market economies, but the United States stands to benefit in terms of seigniorage and financial stability from those who do. Seigniorage sharing offers compensation for the spillover benefits.

1. The officially dollarized countries are East Timor, Ecuador, El Salvador, Guam, Guatemala, Marshall Island, Micronesia, Northern Mariana Island, Palau, Panama, Pitcairn Island (partial), Puerto Rico, American Samoa, Turks and Caicos Islands, British Virgin Islands, and American Virgin Islands.

2. We use the term dollarization only in reference to the substitution of U.S. dollars for the local currency of a country. Often dollarization refers to the substitution of any reserve currency for a local currency. We also focus on Latin America.

Unofficial Dollarization

Unofficial dollarization became widespread in Latin America as a consequence of the unstable monetary conditions of the 1970s and 1980s. Latin American countries had some of the highest rates of inflation among emerging-market economies during this time (table 1). In a few cases, notably Argentina, Brazil, and Peru, this included hyperinflations, that is, inflation rates at 50 percent or greater per month (see IMF 2001). At the national level, such high rates of inflation hamper growth and development, largely by interfering with capital accumulation. High rates of inflation make the real return on savings uncertain and exacerbate distortions that interfere with the allocative efficiency of the financial sector.³

At the individual level, inflation encourages dollarization. Residents of emerging-market economies commonly protect the real value of their nominal wealth by relying on U.S. dollars to perform the traditional functions of money.⁴ Estimates suggest that unofficial dollarization is extensive. Using the proportion of foreign-currency-denominated deposits in banks to broad money as a proxy for the extent of overall dollarization, an IMF study found that in 1995, dollar deposits exceeded 30 percent of the broad money stock in Argentina, Bolivia, Costa Rica, Nicaragua, Peru, and Uruguay, and that dollar deposits were significant but less than 30 percent of the broad money stock in Ecuador, El Salvador, Honduras, Jamaica, and Mexico.⁵ This, however, was undoubtedly an underestimate of the extent of dollarization. For one thing, it does not include dollar-denominated currency. Porter and Judson (1996) found that as much as 70 percent of all U.S. currency in 1995 was held outside the United States. In addition, residents of developing countries hold dollar deposits beyond their shores, and banks in developing countries typically denominate a substantial portion of their loan portfolios in dollars. Anecdotal evidence suggests that in some countries, such as Uruguay, nearly 80 percent of all monetary and financial transactions involve dollars.

While this partial, unofficial dollarization protects individuals from an inflation tax leveled on the local currency and extends investment opportunities to them, it also tends to expose the developing country as a whole to foreign-exchange risk and to increase its vulnerability to currency crises. Because foreigners typically refuse long positions in the inflation-prone local currencies of emerging-market

3. On the relationship between inflation and economic growth, see the papers contained in Federal Reserve Bank of St. Louis (1996).

4. Much of the literature differentiates between asset substitution and currency substitution. Asset substitution occurs when residents hold financial wealth in foreign-currency-denominated assets. Portfolio decisions may motivate asset substitution, even in highly developed countries. Currency substitution occurs when residents use foreign-currency-denominated assets as a means of payment and set prices in foreign currencies. Currency substitution is a response to monetary instability. See Baliño et al. (1999, p. 5).

5. Baliño et al. (1999), table 1, p. 2.

TABLE 1 | INFLATION IN DEVELOPING COUNTRIES (annual percent change)

	Average			1998	1999	2000
	1982-91	1992-94	1995-97			
All developing countries	45.1	49.1	16.2	10.5	6.8	6.0
Western hemisphere	163.0	181.7	23.4	9.9	8.8	8.1
Argentina	452.7	13.3	1.4	0.9	-1.2	-0.9
Bolivia	220.0	9.5	9.1	7.7	2.2	4.6
Brazil	384.7	1,675.2	29.6	3.2	4.9	7.0
Chile	20.5	13.2	7.2	5.1	3.3	3.8
Colombia	23.9	24.1	20.1	18.7	10.9	9.2
Ecuador	39.7	42.3	26.0	36.1	52.2	96.2
Mexico	64.4	10.8	30.0	15.9	16.6	9.5
Paraguay	22.8	18.0	10.1	11.6	6.8	9.0
Uruguay	67.3	55.9	30.4	10.9	5.7	4.8
Venezuela	25.1	43.4	69.9	35.8	23.6	16.2

Note: Inflation measured by consumer prices.

SOURCE: International Monetary Fund, *World Economic Outlook*, October 2001.

countries, local residents must denominate their international transactions in U.S. dollars. Overall, dollar liabilities within emerging markets tend to exceed dollar assets. Calvo (2001) regards this balance-sheet mismatch, which he calls *liability dollarization*, as especially pernicious. He contends that liability dollarization encourages local governments to manage their exchange rates in such a way as to avoid timely adjustment. Indeed, evidence suggest that emerging markets allow substantially less variation in their exchange rates than developed countries even when both supposedly maintain flexible exchange rate systems, and that emerging-market countries hold substantially larger amounts of foreign-currency reserves relative to imports and to GDP than industrial countries (Mussa et al., 2000, p. 29). Presumably, these funds are for exchange rate management. This *fear of floating*, as Calvo and Reinhart (2000) call it, sets up the necessary conditions for speculative attacks and currency crises.

Once dollarization becomes fairly widespread, it persists and may even continue to progress despite successful stabilization programs that lower the rate of inflation, particularly if the past inflation experience was long-lived and extreme.⁶ Switching currencies involves substantial fixed transactions costs stemming from network economies within the payments system. These switching costs prevent a rapid de-dollarization when inflation falls. Before a stabilization plan can de-dollarize a developing economy, expected inflation and monetary uncertainty must fall far enough to lower the opportunity cost of holding the local currency vis-à-vis the dollar, and it also must offset the fixed transactions costs associated with the switch back from dollars.⁷ The more widespread dollarization is and the greater the degree of financial liberalization a country has attained, the larger these transactions costs become, and the more persistent unofficial dollarization will prove.

Any stabilization program must gain public confidence in its durability, and this has proven to be a difficult task. Argentina, for example, successfully pegged its peso to the dollar between 1991 and early this year through a currency-board type of arrangement and maintained an inflation rate similar to, and often below, that in the United States. Nevertheless, the ratio of foreign-currency deposits to broad money in that country actually rose from 35 percent in 1991 to nearly 44 percent in 1995.⁸ Interest rates on peso loans and deposits often exceeded interest rates on comparable dollar loans and deposits, suggesting that the market imposed an exchange rate risk premium on locally denominated securities. These factors indicate that even a currency board can lack full credibility. The uncertainty may have business cycle implications.⁹

A key factor undermining monetary reforms is fiscal profligacy. Although Argentina also adopted some structural reform, only recently, and belatedly, did it take steps to rationalize a fiscal process that promoted deficit spending and saddled the country with large public debts. Large, persistent budget deficits increase the likelihood that a government will return to the inflation tax in the future.¹⁰ For example, Buenos Aires and other Argentine provinces made payments for current transactions with newly issued securities, despite the currency board. In many emerging-market economies, the central government is fiscally weak relative to the state governments or relative to political interests throughout the country. In Argentina, for example, the federal government collects and distributes most of the taxes, but the provinces undertake most of the expenditures. The disconnect between expenditures and revenues encourages provincial governments to expand outlays in hopes of garnering more revenues.¹¹

6. See, for example, Clements and Schwartz (1993), who provide a case study of currency substitution in Bolivia.

7. Guidotti and Rodriguez (1992) discuss and formalize these ideas. They show that dollarization in Bolivia, Mexico, Peru, and Uruguay was nonstationary while inflation differentials (with the United States) were stationary, and that dollarization is not cointegrated with the inflation differential.

8. Baliño et al. (1999), table 1, p. 2.

9. Mendoza (2001) suggests that the risk of devaluation affects international investors' decisions and induces price distortions that accentuate business cycle fluctuations in developing countries.

10. The IMF (2001, box 4.2, p. 124) finds a significant and consistent long-run relationship between the size of government budget deficits and inflation in emerging markets.

11. See Saiegh and Tommasi (1999) and Cooper and Kempf (2001).

A second factor underlying the credibility problems of many developing countries is weak financial systems—inadequate capital, poor regulation, and risky lending. State and federal governments in developing countries often share the burden of supporting a distressed banking sector, particularly when a currency crisis has caused the problem. Often state and local governments have substantial equity stakes in these banks. Bailouts typically take the form of an expansion of the monetary base that results in higher inflation and currency devaluation. Consequently, inflation is associated with the weakness of the domestic financial sector. Even independent of inflation, financial market distortions hamper the investment and growth that ultimately determine a country's ability to advance and develop.¹²

12. See Levine and Carkovic (2001).

Official Dollarization and Seigniorage Losses

Despite the damage that inflation can do to growth and development, few developing-country governments seem eager to dollarize. Official dollarization gives the U.S. dollar full legal-tender status for all transactions (and contracts) in a country. This may involve withdrawing the regional currency or allowing the dollar to circulate with the same legal status as the domestic currency. Dollarization might also involve providing parallel legal status to more than one reserve currency—for example, U.S. dollars and euros—and allowing individuals to freely choose among them and the local currency for use in any type of contract or transaction (see Bogetic 2000).

Emerging-market governments have not embraced dollarization because they can gain real revenue both through the inflation tax and through the interaction of inflation and progressive income taxes. They often can reduce the real value of their outstanding government debts through inflation. Hence, in times of fiscal crisis, inflation and depreciation offer an alternative to higher taxes or spending cuts.¹³ Sometimes, governments can temporarily induce favorable changes in real economic variables through inflation and improve their election prospects. An IMF study found that inflation in Latin America often exceeded the rate for optimal seigniorage (IMF 2001, p. 119), so while I will discuss only seigniorage revenue below, one should keep the other incentives to inflate in mind.

13. See Sims (2001).

Seigniorage is the revenue that governments earn from issuing fiat money instead of interest-bearing debt. Economists typically measure the annual flow of seigniorage as the change in the

TABLE 2 | SEIGNIORAGE IN TEN LATIN AMERICAN COUNTRIES

	Seigniorage ^a 1990–2000 (Percent of GDP)	Monetary base ^b 2000 (\$ equivalent)	Future ^c seigniorage (\$ equivalent)
Argentina	1.0	\$15.1 billion	\$19.8 billion
Bolivia	1.0	\$0.8 billion	\$1.8 billion
Brazil	4.2	\$36.6 billion	\$36.0 billion
Chile	5.6	\$27.5 million	\$0.4 billion
Columbia	1.4	\$5.2 million	\$5.6 million
Ecuador	0.1	<\$0.1 million	<\$0.1million
Mexico	0.9	\$27.2 million	\$80.6 million
Paraguay	1.7	\$0.9 million	\$0.5 million
Uruguay	4.2	\$3.0 billion	\$0.9 billion
Venezuela	2.4	\$8.6 million	\$3.9 million

a. The average value between 1990 and 2000 of change in the monetary base from year $t-1$ to year t divided by GDP in year t .

b. Level in local currency converted to dollars using average exchange rate in 2000.

c. Present discounted value of future seigniorage based on formula in Velde and Veracierto (2000). Assumes that base on currency grows at the same rate as real GDP grew between 1994 and 2000 and that the interest rate is equal to the average U.S. Treasury bill rate between 1994 and 2000. Data converted to dollars using average exchange rate in 2000.

SOURCES: International Monetary Fund, *International Financial Statistics*; and author's calculations.

monetary base. This amount represents revenue available to the government for the purchase of interest-earning assets, such as foreign currency reserves, government securities, loans to the banking system, or for consumption. Following Fischer (1982), the second column of table 2 presents estimates of seigniorage revenue for a set of Latin American countries. On average, the countries in this sample earned seigniorage revenue equal to slightly more than 2 percent of nominal GDP between 1990 and 2000. This was substantially greater than the seigniorage earned by the G-7 industrialized countries, which equaled approximately 0.2 percent to 0.3 percent of nominal GDP over the same period.

A country that officially dollarizes will lose seigniorage to the United States.^{14,15} As Berg and Borensztein (2000) explain, this loss consists of two components. First, the dollarizing country will convert its outstanding monetary base to dollars.¹⁶ Column 3 of table 2 shows the dollar equivalent (estimated at current exchange rates) of the monetary base in my set of Latin American countries for 2000. At that time, for example, Argentina had an outstanding peso monetary base equal to approximately \$15 billion.¹⁷ Second, a dollarizing country loses the future flow of seigniorage associated with the issuance of currency.¹⁸ Velde and Veracierto (2000) show that the present discounted value of future seigniorage is equal to $(1 + \alpha) \frac{RC_0}{R - \alpha}$, where C_0 is the currency component of the monetary base; R is the average rate of return on government debt, and α is a (constant) growth rate of currency. Because I have no reliable method of predicting R and α in a country that does not dollarize, estimates of the future flow of lost seigniorage are very crude. If, for example, a country generated a high inflation rate, C_0 might be high, R might also be high, but α could actually become negative, as in Ecuador. The values presented in the fourth column of table 2 assume that in the absence of dollarization, currency would have grown at the same rate as each country's real GDP did between 1994 and 2000 and that the interest rate earned there would have equaled the U.S. Treasury bill rate over these same years. For some countries, such as Brazil, the seigniorage costs of dollarization seem to be quite high. For other countries, such as Ecuador, the seigniorage costs are low because the local currency monetary base is relatively small.

Seigniorage Sharing

As already noted, the United States benefits from dollarization because a country that dollarizes loses seigniorage to the United States. Initially, this seigniorage accrues to the Federal Reserve System, but because the Federal Reserve remits its profits to the U.S. Treasury, the seigniorage revenue ends up with the federal government. In addition, however, the United States may benefit from dollarization in developing countries because it reduces the prospects for currency crises, which can create losses and payments system disruptions for U.S. banks, and which, in extreme cases (such as the 1998 Russian default), result in monetary policy responses that complicate the task of maintaining price stability.

By sharing seigniorage revenues, the United States enables dollarizing countries to internalize, at least in part, the positive externalities that their actions create and that the United States enjoys. Seigniorage sharing was common among British colonies, and it is not unheard of today (see Bogetić 2000). Members of the European Monetary Union, for example, share the seigniorage associated with the issue of euros.¹⁹

Previous Seigniorage-Sharing Proposals

At least two proposals for sharing seigniorage with dollarizing countries have already been made. The U.S. Joint Economic Committee (JEC 1999), for example, recommends sharing seigniorage associated

14. A country that is unofficially dollarized also loses seigniorage to the United States.

15. As the Joint Economic Committee (1999) notes, U.S. possessions that dollarize, for example, Guam or Puerto Rico, indirectly receive a share of seigniorage through federal spending.

16. In the discussion that follows, we assume that the dollarizing country intends to completely replace the local currency with dollars. If the dollarizing country allowed the dollar to circulate along with the local currency, the pace of conversion would change along with the demand for U.S. dollars.

17. Under Argentina's currency board, U.S. dollars backed the peso monetary base. Because Argentina could invest the dollar backing in interest-earning dollar assets, Argentina did not lose seigniorage to the United States under the currency board.

18. The second seigniorage component considers only currency because once the dollarizing country converts its monetary base to dollars, the reserve component of the base would be invested in interest-earning dollar assets and, therefore, would not incur a seigniorage loss.

19. Stevens (1999) explains that the participating national central banks pool and distribute the earnings of their monetary operations among themselves in proportion to their holdings of capital in the European Central Bank.

with the initial conversion of the domestic currency into dollars and with any subsequent increase in the dollars circulating there. The JEC would not share seigniorage on any U.S. currency held abroad before a country officially dollarized. Under the JEC proposal, the Federal Reserve would make quarterly seigniorage-sharing payments, consistent with a formula. Accordingly, the Federal Reserve would calculate the total net seigniorage that accrues to the United States from issuing base money and would allocate a portion of this amount to specific dollarizing countries in proportion to the amount by which U.S. currency in that country increases because of dollarization.²⁰ The JEC also recommends that the United States withhold from newly dollarizing countries 15 percent of their estimated seigniorage payments and that the United States use this amount to partially reimburse countries that are already dollarized, such as Panama, for their past seigniorage losses.

To qualify for seigniorage sharing under the JEC proposal, a dollarizing country must withdraw from circulation the entire domestic monetary base (with the possible exception of domestic coins). To facilitate this substitution, a dollarizing country could sell to the Federal Reserve System certain preapproved, liquid dollar assets, such as U.S. Treasury securities, deposits at the Federal Reserve, or funds in U.S. commercial banks. These securities would act as collateral against the prospects that the emerging-market economy might re-issue its own currency after receiving U.S. seigniorage-sharing payments.

Harvard economist Robert Barro (1999) offers a different recommendation for seigniorage sharing. He suggests a one-time transfer to an emerging-market economy equal to the circulation of its local currency at the current exchange rate. Unlike the JEC, he would not compensate dollarizing countries for future seigniorage losses. The dollarizing country would exchange its currency with the Federal Reserve, which would hold the currency as collateral against the prospects that the dollarizing country might re-issue its own currency after receiving U.S. seigniorage-sharing payments.

An Incentive-Compatible Proposal

While both of these proposals are feasible, I offer an alternative that would allow a dollarizing country to continue to issue its own currency and would encourage the country's leadership to make institutional adjustments compatible with maintaining monetary stability.²¹ I propose that the U.S. Treasury buy relatively short-term, dollar-denominated, zero-coupon bonds at their face value from countries that grant the dollar full legal-tender status, and that, at the explicit direction of Congress, the Federal Reserve monetize these bonds as it would special drawing rights or gold held by the U.S. Treasury.²² Purchasing the zero-coupon bonds at face value would immediately return the potential interest costs of the securities to the issuing country as seigniorage. The Treasury would assume no exchange risk, since the securities are dollar-denominated, but the Treasury would incur any sovereign risk associated with the emerging-market securities. To minimize this sovereign risk, the Treasury would impose two general conditions on these transactions: First, the emerging-market economy would agree to redeem the securities at maturity should the U.S. Treasury request that they do so. Redemption would ensure that the emerging-market economy conformed to other conditions (discussed below). Second, the Treasury would agree routinely to roll over these securities, providing that the emerging-market government continually met certain criteria that enhanced their creditworthiness.²³

Chief among these criteria, the dollarizing country must grant, and maintain, legal-tender status for the U.S. dollar equal to that of the local currency and any other circulating reserve currencies. Unlike the JEC's and Barro's proposals, I would not preclude a dollarizing country from issuing its own

20. The JEC formula is

$$S_i = [(MB_{Total}^S \cdot R_{TBill}) - E_{Fed}] \cdot \frac{\Delta C_i^S}{MB_{Total}^S} \cdot p_i$$

where S_i is the net seigniorage payment to country i ; MB_{Total}^S is the total monetary base measured over a specified period; R_{TBill} is the 3-month Treasury bill rate; E_{Fed} is the net cost of operating the Federal Reserve System; ΔC_i^S is the increase in the dollar currency in country i as a result of official dollarization in country i ; and p_i is an arbitrary proportion determined by Congress.

21. Economists George Selgin (2001) and Steve Hanke (2001) have suggested dollarizing Argentina by allowing private banks to issue their own dollar-denominated bank notes. Banks would back these notes with dollar assets and would convert them to U.S. dollar notes on demand. This process for dollarization would enable these Argentine banks to retain seigniorage.

22. Instead of a zero coupon, the bonds might pay a small amount of interest to cover U.S. Treasury costs of administering the program or to cover any sovereign risk associated with the securities.

23. Alternatively, the securities might be a type of consol, instead of a short-term obligation. The Treasury, however, must be able to sell the securities back to the issuer on fairly short notice, if this seigniorage-sharing proposal is to provide incentives for more basic structural reforms.

currency. Allowing the local currency to coexist with the U.S. dollar would encourage a competition between the circulating currencies that would help secure their stable purchasing power. The ability to switch among the local currency, U.S. dollars, and any other reserve currency imposes discipline on the emerging-market economy and, to some extent, on monetary policy in the United States.

In addition, before holding or rolling over the dollar-denominated securities, the U.S. Treasury also would impose limitations on fiscal deficits and on the overall governmental debt—federal, state, and local—of the dollarizing country. Moreover, the Treasury would guarantee that the financial system was privatized, regulated to conform with standard capital adequacy requirements and sound lending practices, and open to foreign competition. By imposing these institutional requirements, the seigniorage-sharing arrangement would provide an incentive for the dollarizing country to adopt institutional changes compatible with dollarization, growth, and development.

Initially, the U.S. Treasury would buy these securities to enable the foreign country to dollarize its monetary base. After that, the Treasury would accommodate future increases in the demand for currency.²⁴ As noted, the Federal Reserve would monetize these securities, subject to some overall limitation established by the Federal Open Market Committee. Because the transactions would merely satisfy foreign demand for U.S. currency, they would not be inflationary to the United States. The seigniorage-sharing proposal, however, could permit the emerging-market economy some further latitude for selling additional amounts of dollar-denominated securities to the U.S. Treasury. The System would monetize these securities for the U.S. Treasury, but would also sterilize any transaction that threatened to generate inflation by exceeding the demand for currency in the dollarized country. This sterilization would occur automatically as long as the System operated with a federal funds rate target.

24. Because dollar-denominated bank reserves would be invested in interest-earning assets, they would earn seigniorage.

Optimal Currency Area Concerns

Whereas the fiscal authorities in emerging markets that are contemplating dollarization might focus on the loss of seigniorage revenues, their economic advisors will surely raise two traditional concerns: Dollarization prevents the nominal exchange rate from fostering needed terms-of-trade adjustments, and dollarization hinders the government's ability to act as lender of last resort. These are important costs against which to compare the benefits of dollarization, but they are not necessarily domineering concerns.

Terms-of-Trade Adjustment

Changes in a country's terms of trade maintain the efficient (and full) use of resources following asymmetric economic shocks.²⁵ Dollarizing forces any terms-of-trade adjustments vis-à-vis the United States or third countries entirely through domestic prices and wages. Because these are generally slow to change, unemployment will typically accompany the adjustment process. Although such factors as resource mobility, financial market integration, and fiscal transfers can lessen the adjustment costs, they probably cannot prevent some unemployment when wages and prices are sticky.

This argument, however, is static. Dollarization could initiate long-term structural changes that can eventually mitigate the need for terms-of-trade adjustments, particularly if dollarization is widespread throughout Latin America. Rose (2000), for example, finds that sharing a common currency reduces transactions costs and tends to increase trade between the participating countries roughly by a factor of three. In addition, Frankel and Rose (1998) find a strong positive correlation between the degree of bilateral trade and the bilateral correlation of business cycle activity. Similar business cycle

25. The terms of trade are the price of a country's exports relative to the price of its imports, expressed in a common currency. Hence, the terms of trade include two prices and a nominal exchange rate.

patterns among countries using the U.S. dollar should reduce the need for terms-of-trade changes. Together these studies suggest that dollarized countries will eventually find their business cycles more closely synchronized with each other and with the United States. The importance of eliminating the nominal exchange rate as a source of terms-of-trade adjustment will depend on the share of total trade that dollarized countries conduct within the common currency area. Seigniorage sharing could increase the number of countries in a dollar area and, therefore, their total dollar-denominated trade.

Lender of Last Resort

In periods of economic or financial crises, uncertainty about banks' solvency often causes individuals to shift their monetary wealth from bank liabilities to currency. As the public increases its cash-to-deposit ratio, the money supply contracts, leading to a general deflation. A traditional lender of last resort can avoid a contraction in the money supply and prevent a collapse of temporarily illiquid, but solvent, commercial banks by accommodating the increased demand for high-powered money. Usually, the lender of last resort fulfills this function through discount-window operations, but a central bank can also undertake open-market operations.

Although dollarized emerging-market countries can do neither of these, they have other options. For one thing, global branches of U.S. banks may locate in the dollarized country once currency risk is eliminated. These banks are likely to be more diversified than local banks and hence better able to weather domestic shocks. Their ability to borrow from their parent bank can afford them an elastic supply of reserves. Emerging-market economies may also establish a limited, but sufficient, lender-of-last-resort function by establishing credit lines with foreign banks or by maintaining reserves. Moreover, under the proposal for seigniorage sharing presented here, the dollarizing country could issue additional dollar-denominated debt to the United States during an emergency situation. Because this would accommodate a local demand for reserves, it would not result in a higher inflation rate in the United States.

Conclusion

Unofficial dollarization is well advanced in many Latin American countries, and it is not likely to ebb. Official dollarization would afford many of these countries a credible commitment to monetary stability, one that promotes growth by eliminating the possibility of currency crises. The resulting stability and growth would have positive spillover benefits for the United States, which seigniorage sharing helps internalize to the dollarizing country. I hope that this proposal spurs further debate on this issue.

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