

## OFFICIAL DOLLARIZATION: CURRENT EXPERIENCES AND ISSUES

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Dollarization is a portfolio shift away from domestic currency to foreign currency, to fulfill the main functions of money—store of value, unit of account, and medium of exchange. It is typically a result of unstable macroeconomic conditions and is a rational response of people seeking to diversify their assets in the face of heightened domestic currency risk. The process of dollarization may be more or less spontaneous, partial and unofficial, reflecting a piecemeal shift in preferences by individuals for foreign currency, or it may be full and official, in that a country adopts a foreign currency as exclusive or parallel legal tender.

There is an extensive body of writing on unofficial dollarization (see, e.g., Baliño, Bennet, and Borensztein 1999; Agénor and Kahn 1996; Calvo and Végh 1996; Clements and Schwartz 1993; McKinnon 1996; Sahay and Végh 1996; and Savastano 1992). Surprisingly, though, there is little detailed country-specific analysis on official dollarization, save some discussion of Panama, the best-known officially dollarized country. A notable exception is Moreno-Villalaz (1998, 1999). And there is a surprising lack of basic published information on the countries and territories that officially use foreign currency in place of domestically issued currency. In part, this is so because unofficial dollarization is more prevalent than official dollarization, and because officially dollarized countries are very small.

A number of factors have created renewed interest in official dollarization. In Europe, the advent of the euro and the interest of

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Eastern European countries in monetary union with Western Europe—whether by joining the European Central Bank, by unilaterally “dollarizing” via the introduction of the German mark/euro as legal tender (e.g., Montenegro), or by establishing currency boards (e.g., Estonia, Lithuania, Bulgaria, Bosnia, and Herzegovina)—have spurred much research (see, e.g., Begg 1997; Dornbusch 1997; IMF 1997; Masson 1996; and Bogetić 2000a, 2000b). In Latin America, the experience of Argentina’s currency board-like system since 1991 and Panama’s history of official dollarization since 1904 have stirred debate, especially in Argentina, El Salvador, and Mexico. Most recently, Ecuador’s dollarization project, which began on January 9, 2000, has intensified academic and policy debate and moved it closer toward practical policy issues that arise in the course of implementing official dollarization. Finally, the worldwide effects of financial crises in Mexico and Argentina (1994–95), East Asia (1997–98), Russia (1998), and Brazil (1998–99) have motivated reexamination of the characteristics of stable exchange rate regimes.

Even so, literature on official dollarization remains scant and new contributions are emerging only very recently, largely motivated by the Argentine and Ecuadorian dollarization projects (see, e.g., Borensztein and Berg 2000; Bogetić and Schuler 1999; Calvo 1999a, 1999b; Hanke and Schuler 1999; Hanke (2000); and Joint Economic Committee 2000). This paper attempts to remedy the shortage by answering several key questions:

- What is the present incidence of officially dollarized economies, and what are some of their salient characteristics?
- What has been the experience of Panama, the largest and most well-known officially dollarized economy?
- What do we know about the economic costs and benefits of official dollarization?
- What are the existing and prospective seigniorage sharing arrangements?
- What conditions may be conducive to official dollarization?
- What are the prospects for official dollarization in Argentina and other Western Hemisphere countries?

### Unofficial and Official Dollarization: How Do They Differ?

Dollarization usually refers to unofficial dollarization, which is far more widespread than official dollarization. As is common, I use dollarization to refer to the use of any foreign currency, not only the U.S. dollar. I distinguish between unofficial and official dollarization

to highlight important differences and to underpin later discussion of the costs and benefits of official dollarization. The crucial difference between unofficial and official dollarization is whether the foreign currency is used voluntarily by residents even though it is not legal tender or whether it is officially recognized as legal tender by the government.

### *Unofficial Dollarization*

Unofficial dollarization occurs when residents of a country choose to hold a large share of their financial wealth in assets denominated in foreign currency, where foreign currency lacks the legal tender privileges that domestic currency enjoys (Baliño et al. 1999: 1). Unofficial dollarization may take a variety of forms, including holding (1) foreign currency bonds or other noncash assets; (2) foreign currency cash, whether possessing it is legal or illegal; (3) foreign currency deposits in domestic banks; and (4) foreign currency deposits in foreign banks. It is useful to distinguish between currency substitution, which is the use of foreign cash and foreign currency deposits primarily as a means of payment, and asset substitution, which is the use of foreign currency assets primarily as a store of value. Economists have generally associated unofficial dollarization with asset substitution, particularly substitution of foreign currency deposits for domestic currency deposits, which is an easily measured indicator (Baliño et al. 1999: 5; and Calvo and Végh 1996).

The mixture among these forms of unofficial dollarization varies across countries, depending on economic, legal, and institutional factors. Where residents have had time to adapt to high inflation, all four types of unofficial dollarization may occur simultaneously, and holdings of residents of foreign currency in cash or in foreign bank deposits may be significant. Where high inflation is relatively new, residents may have some foreign currency deposits in domestic or foreign banks but hold little foreign cash. In the process of unofficial dollarization, a “flight to currency quality” in deposits typically precedes a flight from domestic currency cash to foreign currency cash. Exchange controls may unintentionally encourage unofficial dollarization, by making people afraid that when they want foreign currency they will be unable to obtain it legally at any price.

Today, unofficial dollarization is significant in many developing countries, including economies in transition from socialism. A recent IMF study measured unofficial dollarization by the ratio of foreign currency deposits to the broad money supply (M2 or M3). In 1995, 18 countries with IMF arrangements had high unofficial dollarization

(exceeding 30 percent), with the average degree of dollarization of 45 percent. Another 34 countries had moderate unofficial dollarization, averaging about 16 percent of the broad money supply. Unofficial dollarization was not limited to developing countries: foreign currency deposits were about 22 percent of broad money in Greece and more than 15 percent in the United Kingdom (Baliño et al. 1999: 2). While there are no firm estimates of U.S. dollar notes (paper currency) circulating outside the United States, Porter and Judson (1996: 283) recently estimated the proportion at 50 to 70 percent of the total.

### *Officially Dollarized and Bimonetary Systems*

Official or full dollarization is a complete monetary union with a foreign country from which a country imports a currency, by making the foreign currency full legal tender and reducing its own currency, if any, to a subsidiary role. In officially dollarized countries, there is no domestic currency, no currency risk and, therefore, no risk of currency crises. As a result, domestic interest rate structure tends to be similar to the one prevailing in the wider monetary area. In a few countries, which we also include in this category as borderline cases—perhaps better called bimonetary systems—a foreign currency is used widely in the role of legal tender but it has a subsidiary role to the domestic currency.

Only a relatively small number of countries have officially adopted a foreign currency as legal tender. The reasons include the political symbolism of a national currency, historical patterns of use of domestic and foreign currency, and economic factors such as the perceived costs of dollarization, primarily in terms of the loss of independent monetary and exchange policies, seigniorage revenues, and domestic lender of last resort. Roughly 10.5 million people live in officially dollarized economies today. As of the start of 2000, 28 countries and territories have officially dollarized economies (Table 1). All are small. Many are islands, often with only a few thousand inhabitants. Six are members of the IMF: Kiribati, the Marshall Islands, Micronesia, Palau, Panama, and San Marino. Of the six, the best known is Panama, which has 2.7 million people and a 1998 GDP of US\$9.1 billion.

Official dollarization has more than one form. Officially dollarized economies vary with respect to the number of foreign currencies they allow to circulate as full legal tender and with respect to the relationship between domestic currency, if it exists, and foreign currency. Most dollarized countries give only one foreign currency full legal tender status, but Andorra gives it to both the French franc and the Spanish peseta (now themselves both subdivisions of the euro bloc).

TABLE 1  
FULLY DOLLARIZED ECONOMIES IN 1999

Country	Population	Political Status	Currency Used	Since
Andorra	73,000	Independent	French franc/euro, Spanish peseta/euro <sup>b</sup>	1278
Cook Islands	18,500	New Zealand self-governing territory	New Zealand dollar	1995
Cyprus, Northern	180,000	Independent (de facto)	Turkish lira	1974
Greenland	56,000	Danish self-governing region	Danish krone	Before 1800
Guam	160,000	U.S. territory	U.S. dollar	1898
Kiribati <sup>a</sup>	82,000	Independent	Australian dollar, own coins	1943
Liechtenstein	31,000	Independent	Swiss franc	1921
Marshall Islands <sup>a</sup>	61,000	Independent	U.S. dollar	1944
Micronesia <sup>a</sup>	130,000	Independent	U.S. dollar	1944
Monaco	32,000	Independent	French franc/euro	1865
Montenegro	650,000	Republic within FRY	German mark/euro	1999
Nauru	10,000	Independent	Australian dollar	1914
Northern Mariana Islands	48,000	U.S. commonwealth	U.S. dollar	1944

*continued*

TABLE 1 (continued)  
FULLY DOLLARIZED ECONOMIES IN 1999

Country	Population	Political Status	Currency Used	Since
Palau <sup>a</sup>	17,000	Independent	U.S. dollar	1944
Panama <sup>a</sup>	2.7 mn	Independent	U.S. dollar notes and coins, Panamanian balboa coins	1904
Puerto Rico	3.8 mn	U.S. commonwealth	U.S. dollar	1899
Saint Helena	5,600	British colony	pound sterling	1834
Samoa, American	60,000	U.S. territory	U.S. dollar	1899
San Marino <sup>a</sup>	26,000	Independent	Italian lira/euro, own coins	1897
Tuvalu	11,000	Independent	Australian dollar, own coins	1892
Vatican City	1,000	Independent	Italian lira/euro, own coins	1929
Virgin Islands, U.K.	18,000	British dependency	U.S. dollar	1973
Virgin Islands, U.S.	97,000	U.S. territory	U.S. dollar	1934

<sup>a</sup>IMF member country.

<sup>b</sup>Issues Andorran dimer coins for collectors.

SOURCES: *The Statesman's Year-Book*, various issues; IMF (1998b); IMF Web site (for information on member countries); and IMF *World Economic Outlook* data. In addition, a few other, very small territories use foreign currencies, such as Niue (New Zealand dollar), Norfolk Island, Cocos (keeling) Islands (Australian dollar), Pitcairn Island (New Zealand dollar and U.S. dollar), Tokelau (New Zealand dollar), and Turks and Caicos Island (U.S. dollar).

Despite these modest numbers, official dollarization is attracting increasing attention. In part this is due to the emergence of the euro, Ecuador's dollarization project, the possible official dollarization of Argentina, and the recent surge in interest and practice of a close institutional cousin of official dollarization—the currency boards—five of which were introduced during the past decade: Argentina (1991), Estonia (1992), Lithuania (1994), Bulgaria (1997), and Bosnia and Herzegovina (1998). Recently, on November 2, 1999, Montenegro dollarized its economy by making the German mark legal tender in parallel to the Yugoslav dinar, before it officially withdrew the Yugoslav dinar from circulation on November 13, 2000, making the German mark the sole legal tender. And the U.N. has introduced the German mark and the U.S. dollar for use in Kosovo and East Timor. These developments are likely to alter the monetary map of the world dramatically in the 21st century. They may reflect a more fundamental aspect of globalization, implying a gradual movement toward a smaller number of key currencies, such as the dollar, euro, and yen (Mundell 1999).

In countries with official dollarization, there is no domestic currency at all or the domestic currency has a distinctly subsidiary role. Panama, for example, issues its own coins, but uses U.S. dollar notes. A variation of this is what one might call an *officially bimonetary system* (Table 2) in which a foreign currency is legal tender and may dominate bank deposits, but may not dominate payment of wages, taxes, and everyday transactions such as grocery shopping. Examples are Namibia and Lesotho, which are members of the Common Monetary Area with South Africa. They are also the only independent countries that collect seigniorage from either dollarization or a bimonetary system. The CMA has an agreement for sharing seigniorage and for maintaining common exchange controls with outside countries. The Namibian dollar and the Lesotho loti both circulate at one-to-one with the South African rand.

By virtue of their small size, officially dollarized economies are highly open. Most have convertibility for current account transactions. Five of the six that are members of the IMF have long accepted Article VIII of the IMF Articles of Agreement, which obliges them not to impose controls on current account transactions (Table 3). Officially dollarized economies also have few or no restrictions on capital account transactions, and transactions for external payments are relatively free.

Likewise, bimonetary systems typically have highly open economies with liberal current and capital account regulations (Table 4). As of 1999, there are 17 such countries and territories. Again, all are

TABLE 2  
BIMONETARY SYSTEMS IN 1999<sup>a</sup>

Country	Population	Political Status	Currency Used	Since
Bahamas <sup>b</sup>	290,000	Independent	Bahamian dollar, U.S. dollar	1966
Bhutan <sup>b</sup>	1.9 mn	Independent	Bhutan ngultrum, Indian rupee	1974
Bosnia and Herzegovina <sup>b,d</sup>	4.1 mn	Independent	Bosnian convertible marka, German mark, Croatian kuna, Yugoslav dinar	1998
Brunei Darussalam <sup>b,d</sup>	300,000	Independent	Brunei dollar, Singapore dollar	1967
Cambodia <sup>b</sup>	10.6 mn	Independent	Cambodian riel, U.S. dollar	1980
East Timor	800,000	Under the U.N. administration	U.S. dollar, Indonesian rupee	2000
Haiti <sup>b</sup>	8 mn	Independent	Haitian gourde, U.S. dollar	n.a.
Isle of Man	72,000	British dependency	pound sterling, local pound	1800s
Kosovo	1.8 mn	Under the U.N. administration	German mark, Yugoslav dinar	1999
Lao PDR <sup>b</sup>	4.7 mn	Independent	Lao kip, Thai baht, U.S. dollar	n.a.
Lesotho <sup>b,e</sup>	2.1 mn	Independent	Lesotho loti, South African rand	1974
Liberia <sup>b</sup>	2.9 mn	Independent	U.S. and Liberian dollars	1944
Luxembourg <sup>b</sup>	420,000	Independent	Luxembourg franc/euro, Belgian franc/euro	1945

TABLE 2 (continued)

Country	Population	Political Status	Currency Used	Since
Namibia <sup>b,e</sup>	1.6 mn	Independent	Namibian dollar, South African rand	1993
Tajikistan <sup>b</sup>	5.8 mn	Independent	Tajik ruble, use of other currencies permitted	1994

<sup>a</sup>The identification of bimonetary systems relies on the classification of currency regimes in the *Exchange Arrangements and Exchange Restrictions* Annual Report 1998, IMF. Included in the list of bimonetary systems are those countries that are using, according to this report, foreign currency as "other legal tender," which means that the foreign currency, while circulating widely, plays a subsidiary role to the domestic currency.

<sup>b</sup>IMF member country.

<sup>c</sup>Bosnia and Herzegovina operates a currency board with its currency, Konvertibilna marka tied to the German mark at par.

<sup>d</sup>Brunei Darussalam operates a currency board. The Brunei dollar is tied to the Singapore dollar at the rate 1 Brunei dollar = 1 Singapore dollar.

<sup>e</sup>Uniquely among fully dollarized and bimonetary systems, Lesotho and Namibia have a seigniorage sharing agreement with South Africa, the other member of the Common Monetary Area.

SOURCES: IMF Exchange Arrangements and Exchange Restrictions (1998b); IMF Web site (for information on member countries); *The Statesman's Year-Book*, various issues; and IMF *World Economic Outlook* data. Also, Channel Islands uses British pound and local pound concurrently.

TABLE 3  
EXCHANGE CONTROLS IN OFFICIALLY DOLLARIZED IMF MEMBER COUNTRIES, 1998

Country	Accepted Article VIII	Capital Controls	Controls on Invisible Transactions and Current Transfers	Main Source of Export Earnings
Kiribati	August 22, 1986	Only on inward direct investments above Australian \$250,000	None	Services, income, transfers
Marshall Islands	May 21, 1992	Application and licence required	None	Services, income, transfers
Micronesia	June 24, 1993	Application and licence required for inward direct investments	None	Services, income, transfers
Palau	New member December 17, 1997	Unavailable	Unavailable	Tourism services
Panama	November 26, 1946	None	None	Services, income, transfers
San Marino	September 23, 1992	None	Foreign direct investment requires government approval	Unavailable

NOTES: IMF members accepting the obligations of Article VIII of the IMF Articles of Agreement make a commitment to refrain from imposing restrictions on payments and transfers for current account transactions and to refrain from discriminatory currency arrangements or multiple currency practices without IMF approval. Most IMF member countries have accepted Article VIII. Article XIV of the IMF Articles of Agreement is a weaker requirement, essentially a transitional arrangement until a country accepts Article VIII.

SOURCES: IMF (1998b, exchange restrictions); IMF (1997, Statistical Appendix), and IMF country reports (sources of export earnings).

small though the average size is larger than in officially dollarized systems. They tend to be located in the neighborhood of a dominant economy or groups of economies with which they conduct much of their trade and capital transactions. Hence, the use of the foreign currency in their domestic economies is often necessitated by virtue of their openness and heavy reliance on trade (and factor mobility) with their larger neighbors.

Much like countries operating currency board systems, officially dollarized economies do not have independent monetary policies. Under both systems, the economy adjusts to external shocks through factor and product markets with the help of the financial system, rather than by adjusting exchange rates. Changes in world interest rates and capital inflows or outflows are quickly reflected in the banking system and the availability and terms of credit to the economy. Officially dollarized countries that allow full participation by foreign financial institutions become tightly integrated into large and liquid world financial markets. Financial integration plus official dollarization give banks a worldwide field in which to make loans in dollars. Consequently, the location of loans is not closely linked to the location of deposits. The ability to switch dollar funds without currency risk between the domestic economy and the rest of the world tends to minimize the booms and busts that often arise in countries having independent monetary policies and financial systems not well integrated into the world system.

### Panama's Experience with Official Dollarization

Panama is the largest officially dollarized economy with an almost 100-year experience with such a system. Therefore, it is a natural laboratory for understanding how official dollarization might work in other settings. Clearly, any inferences must make appropriate caveats and be based on a thorough understanding of the specifics (and idiosyncrasies) of Panama's experience. The following is a brief overview of some salient characteristics of Panama's experience. (Moreno-Villalaz 1999, Schuler 2000, Bogetić 2000a, and IMF country reports [[www.imf.org](http://www.imf.org)] provide more details.)

#### *Monetary System*

Since 1904, Panama has used U.S. dollar notes (paper money) as domestic currency. Panama issues a domestic currency, the balboa (1 balboa = US\$1), but it circulates only as coins. Panama's financial system has a significant presence of foreign banks. There is no central bank and no centralized foreign reserves. The Banco Nacional de Panamá is a government-owned commercial bank.

TABLE 4  
EXCHANGE CONTROLS IN BIMONETARY IMF MEMBER COUNTRIES, 1998

Country	Accepted Article VIII	Capital Controls	Controls on Invisible Transactions and Current Transfers	Main Source of Export Earnings
Bahamas	December 5, 1973	Approvals required for several types of flows	Approval for transactions above a threshold	Services
Bhutan	Article IV only	Approval of the Royal Monetary Authority (RMA) required	Approval by RMA and quantitative limits	Commodities
Bosnia and Herzegovina	Article XIV only	None	Repatriation requirements	Diversified
Brunei Darussalam	October 10, 1995	Only concerning national food security and land ownership	Subject to a bona fide test	Oil exports
Cambodia	Article XIV only	Approvals for inward direct investment, etc.	Quantitative limits on payments for travel and repatriation and surrender requirements for state enterprises	Commodities and textiles
Haiti	December 22, 1953	Inward direct investments require government approval	None	Light manufactures

TABLE 4 (continued)

Country	Accepted Article VIII	Capital Controls	Controls on Invisible Transactions and Current Transfers	Main Source of Export Earnings
Lao PDR	Article XIV only	Outward transfers by residents not permitted	For payments, information requirement; for proceeds, same as for merchandise exports	Commodities and garments
Lesotho	March 5, 1997	Prior approval for purchase of shares or securities by nonresidents; limits on sales	Repatriation and surrender requirements	Workers' remittances, transfers, manufacturing
Liberia	Article XIV status only	None	None	Unavailable
Luxembourg	February 15, 1961	None	None	Machinery, equipment, metals
Namibia	September 20, 1996	Approval required for some transactions	Repatriation and surrender requirements; restrictions on use of funds outside Common Monetary Area	Primary commodities
Tajikistan	Article XIV only	Approvals and registration requirements	Limits on transfer of foreign workers' wages	Aluminum and cotton

SOURCE: IMF (1998b), IMF (1997, Statistical Appendix), and IMF country reports (sources of export earnings).

*Role of Foreign Banks*

In 1970, a banking law liberalized Panama's financial markets and allowed full entry of foreign banks. The capital account is entirely open, and banks are free to invest excess funds in Panama or abroad. Arguably, full financial integration into the world economy and the consequent ability of banks to adjust their portfolios freely between domestic and foreign assets has been an important mechanism of domestic adjustment, preventing the booms and busts in lending, overvalued exchange rates, and falling foreign reserves that have plagued other countries in the region. Foreign banks, mainly U.S. banks, have been de facto lenders of last resort, increasing their exposure to the domestic economy when it has suffered unfavorable shocks because they have perceived opportunities for profitable lending.

*Macroeconomic Performance*

Panama's macroeconomic performance has been solid. Inflation has averaged 3 percent per year in the 1961–97 period. Growth averaged 8.1 percent from 1961 to 1971 and again from 1978 to 1981, and has averaged 2.5 percent in other years. Real interest rates have remained in low-to mid-single digits. The real exchange rate has shown little variation compared with the real exchange rates of other Latin American countries. There have been no systemic banking crises.

*Lender of Last Resort*

Panama has no domestic lender of last resort. Domestic banks have established lines of credit with foreign banks with branches in Panama and have been able to draw on them during liquidity crunches. The Panamanian government and Banco Nacional de Panamá have not rescued failing banks, but few banks have failed over the past 30 years. A privately funded deposit insurance scheme is in the process of being established in accordance with a 1998 law.

*The Payments System*

The payments system is a real-time gross settlement system operated by the Banco Nacional de Panamá. Payment is effected through the bank's account at a New York bank. Foreign banks sometimes bypass local clearing and clear through the New York Clearing House or the Federal Reserve's Fedwire, as in the case of the branch of a U.S. bank in Panama lending to the branch of another U.S. bank.

There are also banks, such as the Hong Kong and Shanghai Bank, that act as correspondents for other banks in clearing.

### *The Nature of Major Shocks and Economic Adjustment*

Panama has experienced several major shocks that caused significant economic disruption, but the banking system has held up well. The shocks were not related to the monetary system. They included political crises in January 1964, due to riots in the Canal zone, and in 1967–69, the oil shocks of 1973 and 1979, the 1982 Latin American debt default, and the 1988–89 crisis immediately preceding and during the embargo and the U.S. invasion. All caused a withdrawal of domestic deposits and major economic dislocation. However, during the 1964 and 1967–69 crises, several private banks responded by selling their assets abroad and increasing domestic credit, despite the outflow of domestic deposits. This cushioned the adverse impact on the domestic economy (Moreno-Villalaz 1999). In sum, full dollarization in Panama is not a panacea and has not insulated the country from shocks. But those shocks were essentially external to the monetary system. And at least during some major crises, the banks responded in a stabilizing fashion.

### *Sovereign Spreads, Interest Rates, and Availability of Long-Term Credit*

Panama's sovereign spreads have been consistently lower than in other Latin American countries. For example, between September 1, 1994, and April 12, 1999 the average stripped spread on Argentine sovereign bonds (according to the J.P. Morgan Emerging Market Bond Index Plus) was 736 basis points; it exceeded 1,000 basis points around the time of Tequila crisis (February 1995) and Brazil's crisis (September 1988). By contrast, during the subperiod for which data are available for Panama (July 1996 to April 12, 1999), the average stripped spread on its bonds was 405 basis points with a brief spike to about 700 basis points in late August 1998. While not all the difference in the spreads may be attributable solely to the differences in the currency systems between Panama and other countries, these data provide a rough indication of the maximum order of magnitude of reduction in the yield spreads (and, implicitly, country risk) that could be possible if Argentina officially dollarizes its economy. Similarly, the level of spreads and their peaks in Peru, Brazil, Mexico, and Venezuela were consistently higher than in Panama; the exception is Costa Rica (as indicated by Borensztein and Berg 2000).

*Interest Rates*

Nominal interest rates in Panama have persistently been the lowest or nearly the lowest in Latin America (Bogetić 2000a, Schuler 2000, and Borensztein and Berg 2000). Real interest rates have also been relatively low and steady, avoiding the swings from negative to positive double digits that have occurred elsewhere in Latin America. Finally, an important quality of Panama's financial system is the availability of long-term domestic credit. Panama is the only Latin American country where 30-year fixed-rate mortgages are available in "domestic" currency (Moreno-Villalaz 1999, Hausmann et al. 1999). By contrast, in developing countries with relatively stable currencies, loans for 20 or 30 years are often unavailable, and interest rates on shorter term loans are adjusted periodically rather than offered at fixed rates.

*Seigniorage Sharing*

The United States collects all seigniorage on the use of the U.S. dollar in Panama, and there is no seigniorage sharing. Panama collects a small amount of seigniorage on domestic balboa coins that constitute about 9 percent of total cash and coin in circulation.

## Seigniorage Sharing in Officially Dollarized and Bimonetary Systems

Seigniorage sharing used to be common among British colonies operating multicolonial currency boards.<sup>1</sup> That practice, however, has largely disappeared with the replacement of most currency boards with central banks in the 1950s and 1960s.<sup>2</sup> Today, among fully dollarized and bimonetary systems, only one seigniorage sharing arrangement survives, that between Lesotho, Namibia, and South Africa within their CMA agreement. However, seigniorage is the most visible and quantifiable element in the cost-benefit calculus of full dollarization (Fischer 1982). Therefore, seigniorage sharing is likely to figure prominently in any discussion of prospective full dollarization projects, as has already been the case with Argentina. Hence, it is useful to compare the CMA arrangement with the current proposals for Argentina and the United States. Also, it is important to consider

<sup>1</sup>Multicolonial currency boards (as in West Africa, East Africa, the Caribbean, and Malaya) had seigniorage sharing arrangements. Other colonies had individual currency boards that did not share seigniorage with anybody, including the British government (Schuler 1992).

<sup>2</sup>There is rich literature on currency boards, which is currently undergoing revival with the advent of five new currency boards during the 1990s (Argentina, Bulgaria, Bosnia and Herzegovina, Estonia, and Lithuania). See, for example, Hanke (1999, 2000); Hanke and Schuler (1999); Schuler (1998); Baliño et al. (1997); and Ghosh, Gulde, and Wolf (1998).

the implications of the International Monetary Stability Act (S.1879, H.R. 3493), a bill on seigniorage sharing introduced in November 1999 by Senator Connie Mack, chairman of the Joint Economic Committee, and Representative Paul Ryan.

*Seigniorage Sharing in the CMA*

In the CMA, the seigniorage sharing arrangement is determined in Article 6 of the Multilateral Monetary Agreement (Collings 1983). The agreement provides Lesotho and Namibia a share of seigniorage determined as two-thirds of the return on the estimated rand circulation in their territories that these countries would have earned had these funds been invested in South African government securities. The two-thirds share was agreed to as a compromise to take account of the differences between short-term and long-term returns on securities. The rand currency in circulation—the basis for the calculation of the two countries' shares of seigniorage—is estimated using amounts of rand currency at a base date (December 31, 1973), subsequently adjusted to reflect changes in the amount in total rand currency in circulation outside banks in the entire monetary area. The adjustment factors are set as 6:5 for an increase and 4:5 for a decrease, reflecting an assumption of a more rapid monetization in the less developed countries in the monetary union: Lesotho and Namibia. While this arrangement remains the basis for seigniorage sharing today, there were recent modifications that altered somewhat the countries' actual share of seigniorage from the one outlined above.

*Seigniorage Sharing in the European Monetary Union*

Monetary income of the national central banks and net profits of the European Central Bank are distributed according to national central banks' share of the paid-up capital of the ECB, which were determined as an equal-weighted function of population and GDP.

*Possible Seigniorage Sharing Arrangements between the United States and Argentina*

The United States Joint Economic Committee (2000) recently proposed a simple formula for sharing revenues from seigniorage as follows:

$$\begin{aligned} \text{Dollarized country's share of net seigniorage} = & \\ & \{[\text{total average dollar monetary base over the period} \\ & \times \text{average interest rate on 90-day Treasury bills during the} \\ & \text{period}] \\ & - \text{net costs of operating the Federal Reserve}\} \\ & \times \text{dollarized country's share of total dollar monetary base} \\ & \times \text{proportion of seigniorage} \\ & \text{revenue that the United States pays,} \end{aligned}$$

where net seigniorage is simply the difference between the revenue from issuing currency (gross seigniorage) and the costs of printing notes and minting coins and the costs of the staff of the Federal Reserve System.

In contrast to the CMA formula, the proposed U.S.-Argentine formula assumes that the proportion of seigniorage paid by the United States on Argentina's share of dollar monetary base is less than or equal to 100 percent (i.e., the factor equal to or less than 1.0 in the last term of the above formula). It does not allow for a greater share of seigniorage to Argentina arising from a possible faster monetization than in the rest of the dollar monetary area.

Using this formula, the JEC report estimates that Argentina's share of total average dollar monetary base would be about equal to the value of its currency in 1998: US\$16 billion or about 2.8 percent of the total (projected at US\$566 billion at the end of 1999). Furthermore, assuming (1) a 5 percent interest rate on the 90-day Treasury bill as a proxy for the opportunity cost of reserves, (2) net operating costs of the Federal reserves of about US\$1 billion, and (3) an estimated total average dollar monetary base of US\$580 in the year 2000, the report estimates Argentina's dollar share of net seigniorage as follows:

$$\begin{aligned}
 &\text{Argentina's share:} \\
 &= ( [\text{US\$580 billion} \times 0.05] - \text{US\$1 billion} ) \times 0.028 \times 1 \\
 &= (\text{US\$29 billion} - \text{US\$1 billion}) \times 0.028 \times 1 \\
 &= \text{US\$784 million.}
 \end{aligned}$$

### *The Barro Proposal*

Robert Barro (1999) has proposed a radical simplification in the seigniorage sharing debate by advocating that the United States simply transfer to Argentina the U.S. dollar equivalent of its peso currency in circulation, estimated at about US\$16 billion. Instead of receiving annual transfers based on a more complex formula, such as the one proposed by the JEC, Argentina would receive this transfer directly and only once. Notwithstanding the simplicity of the proposal, concerns were raised that such transfers could be subject to a principal-agent problem whereby the agent (i.e., the dollarized country) may not use entirely (or at all) the transfer for the specified purpose (Schuler 2000). While this might not be a problem in the case of Argentina, the problem would presumably be larger if many countries were to fully dollarize under this scheme, due to greater monitoring costs.

*The International Monetary Stability Act*

As these examples show, despite the scarcity of revenue sharing arrangements in the world today, the country of the reserve currency could, in principle, return to a dollarizing country much of its lost seigniorage revenues, thereby reducing significantly the most visible, upfront cost and tilting the dollarizing country's cost-benefit calculus in favor of dollarization. The draft International Monetary Stability Act provides precisely that option (Schuler 2000, Joint Economic Committee 2000). It gives discretionary power to the Secretary of the Treasury to certify officially dollarized countries as eligible to recoup 85 of the seigniorage from the United States, as calculated by the formula provided in the act. The remaining 15 percent would be used to finance seigniorage rebates to countries that are already dollarized (e.g., Panama), help pay the cost of operating the Federal Reserve, and still leave a net revenue to the United States. The formula for calculating the seigniorage provides for more seigniorage rebate to a dollarizing country if U.S. interest rates and the dollar coins and banknotes in worldwide circulation increase.

In a nutshell, the act goes a long way toward making official dollarization less costly to a country considering it. However, as in the recent testimony of Fed chairman Alan Greenspan, the act explicitly rules out the possibility that the U.S. provide lender of last resort or supervision services to the country that decides to officially dollarize.

## Costs and Benefits of Official Dollarization

*Costs*

Conventional analysis of the cost of adoption of foreign currency (Fischer 1982) has focused on the gross costs of official dollarization. In particular, Fischer emphasizes *the loss of seigniorage* from moving from national currency to dollarization. The loss could be thought of either as a one-time stock cost in terms of the amount of new currency that has to be acquired, or a continuing flow cost in terms of seigniorage revenues forgone. These are the costs that are also easiest to measure. But widespread unofficial dollarization suggests that dollarization can have offsetting benefits that are more difficult to measure.

The gross *stock cost* is the cost of initially obtaining the dollar notes and coins necessary to replace national currency in circulation. If domestic currency notes and coins in circulation are 8 percent of GNP as was the world average for 1976 (Fischer 1982), that would be the stock cost of official dollarization. These numbers appear prohibi-

TABLE 5  
ESTIMATED STOCK AND FLOW COSTS OF OFFICIAL  
DOLLARIZATION IN SELECTED LATIN AMERICAN  
COUNTRIES, 1991–97

Country	Period	Stock Cost: C/GDP	Flow Cost: Change in Reserve Money as a Percentage of GDP
Argentina	1991–96	3.7	0.5
Brazil	1994–96	2.1	1.3
Bolivia	1991–97	4.6	1.4
Ecuador	1992–97	12.2	7.4
El Salvador	1991–96	4.1	2.3
Mexico	1991–97	3.3	0.8
Peru	1991–97	2.1	2.5
Average		4.6	2.3

SOURCE: Author's calculations based on IMF *International Financial Statistics*, lines 14 (reserve money), 14a (currency outside deposit money banks), and 99b (GDP).

tively costly. Hence, the case against official dollarization and for national money seemed firmly established.

However, in the years since, financial innovation, technological progress, and the information revolution have progressively reduced the relative size and importance of the monetary base, constraining governments in their pursuit of inflation-induced revenue (Friedman 1992: 254–8). The share of currency in GDP also systematically fell in many countries.<sup>3</sup> For example, in seven selected Latin American countries (Table 5), in the 1991–97 period this share has been 4.6 percent, considerably lower than in the 1970s.

Another way of measuring these costs is to calculate the *flow cost* of dollarization as the continuing loss of seigniorage year after year. By creating base money, domestic monetary authorities buy real resources in exchange for practically nothing, abstracting from the cost of printing money and any remuneration of bank reserves by the monetary authorities. Full dollarization diverts this flow of revenue from the domestic monetary authority to a foreign monetary authority. Therefore, the flow cost may be measured as the change in reserve money in a given year, expressed as percent of GDP. As shown

<sup>3</sup>Richard Rahn (1999) has recently analyzed the worldwide trend toward greater use of electronic forms of money (“digital dollars”) and predicted the end of money in the form of notes and coins (see also Dorn 1997).

in Table 5, that cost averaged 2.3 percent in selected Latin American countries, ranging from 0.5 percent of GDP in Argentina to over 7 percent in Ecuador.

Finally, note that if a dollarized country can recapture seigniorage through an agreement with the country issuing the currency it uses (or a country issues some amount of domestic currency, such as Panama's coins) the *net flow cost* of dollarization will be less than the gross flow cost indicated in Table 5. As indicated, currently only Namibia and Lesotho, which are bimonetary rather than officially dollarized, have such a seigniorage sharing agreement.

We have focused on the stock and flow costs of dollarization because they are the easiest to estimate. *Other costs* range from the quantifiable to the vague. Some may not even be costs, but benefits. We focus on the costs of official dollarization compared to central banking of the standard typical of developing countries. The costs of official dollarization compared with a currency board are somewhat different.

There is the *cost of losing a domestic central bank as a lender of last resort*. There are two issues here. The first is whether an officially dollarized system can provide adequate liquidity to individual banks in need. In general, official dollarization should not reduce the ability of the government to provide liquidity under normal conditions. But an officially dollarized country can achieve the same result if its domestic banks can arrange appropriate credit lines from foreign banks, as in Argentina (BCRA 1998). Alternatively, the government can simply accumulate reserves before official dollarization. Neither arrangement provides as extensive a capability as a lender of last resort as a domestic central bank would. But neither arrangement involves the danger of a central bank creating inflation and costly bank rescues.

The second issue is whether the system can handle systemwide bank runs and payments problems. Official dollarization may reduce the risk of such crises by eliminating the currency risk; by forcing the domestic banking system to become more competitive, transparent, and open to external analysis; and by fostering capital account liberalization and low inflation (IMF 1998a: 10–11). In a number of countries with central banks, banking system crises have been extremely costly (Caprio and Klingebiel 1996a, 1996b; Lindgren et al. 1996). Their cost has sometimes exceeded 40 percent of GDP, as in Chile and Argentina in the 1980s (IMF 1998a: 78 and Table 14).

There is also a *cost of losing flexibility in monetary and exchange rate policy*. In a dollarized monetary system the national government cannot devalue the currency or finance budget deficits by creating inflation, because it does not issue the currency. These features may

be important under some, though probably rare, circumstances similar to the ones prevailing during the Great Depression. Under such circumstances, the inability to devalue would clearly be costly. But under less extreme conditions, the lack of flexibility may be beneficial rather than costly, as shown by the better than average monetary and inflation performance of currency board and dollarized systems compared to central banks (Ghosh et al. 1998, Hanke 1999, Schuler 1996). At the same time, in a globalizing world, with large and rapid capital flows, the scope for truly independent monetary policy is limited. Moreover, at one end of the spectrum, countries operating currency boards have already sacrificed flexibility in monetary policy in exchange for the long-term benefits of low inflation, convertibility, and a stable currency. For them, going the final step entails no *additional* loss of flexibility. At the other end of the spectrum, countries whose monetary policy is chronically unstable and lacking in credibility do not gain much from flexibility, except in the narrow sense that they can use their discretion to vary revenue from seigniorage by changing the rate of monetary expansion.

A related claim is that there is a *cost of linking business cycles* in the dollarizing country to those in the country whose currency it uses. Interest rates tend to rise or fall with those of the foreign country, whereas with a floating exchange rate, or an adjustable peg, they can fluctuate differently. If the ideal for interest rate policy is to act counter cyclically, dollarization probably will not achieve it because the monetary authority of the country whose currency is used presumably directs policy for its own perceived benefit, not necessarily that of dollarized countries. If, on the other hand, the objective is tighter trade and financial links to reap the benefits of full financial integration, official dollarization is the most direct, irreversible, and therefore credible way of achieving that. This claim is closely related to the asymmetric shocks argument (Mundell 1961) in the optimal currency area literature, and the belief that devaluation would be an effective instrument of adjustment under certain conditions. By contrast, Calvo (1999a, 1999b) suggests that devaluation is not a panacea either (particularly in the presence of shocks coming from the capital account) and that it carries significant contractionary risks arising from extensive unofficial dollarization, which is typical of many developing countries.

There is also a *cost of converting prices, computer programs, cash registers, and vending machines* from domestic currency to the foreign currency chosen. This is a one-time expense that will vary considerably from country to country. Finally, there may be associated *legal and financial costs* of revising contracts or refinancing. Similar

costs can occur under central banking during a transition from high to low inflation, though.

### *Benefits*

For discussing the benefits of official dollarization, we again use as the point of reference central banking of the standard typical of developing countries regardless of whether it uses a fixed or flexible exchange rate regime. In qualitative terms, the benefits of official dollarization also apply to a currency board system, though their quantitative significance will vary from country to country. Currency board countries considering official dollarization are facing essentially the same policy tradeoffs as are countries with central banks.

The most obvious benefit of dollarization is that it *eliminates transactions costs* of exchanging one currency for another and greatly *reduces domestic currency risk (or risk of devaluation of domestic currency) and, with it, the risk of currency crises*. This may in turn stabilize the capital flows in and out of a country. The benefit is presumably greatest for countries with a history of currency crises and highly volatile exchange rates resulting from loose monetary policy. The more a country's trade and financial flows are integrated with countries in the dollar zone, the greater will be the savings from eliminating exchange risk. Exchange risk with other currency zones, however, will remain. As indicated above in the section on Panama, eliminating devaluation risk *reduces country risk* to the extent that currency devaluations may feed back into higher interest rates, higher rates of default, and worse economic performance.

For many developing countries, dollarization can *reduce the volatility of the real exchange rate* vis-à-vis countries that have a history of high inflation and unstable exchange rates. For countries with low inflation that manage their exchange rates according to a trade-weighted basket of currencies, it is possible that the multilateral real exchange rate will become more variable. However, the opportunities for hedging against currency movements will also increase. Because the dollar is the most widely used currency in international trade, it has the largest markets for foreign exchange derivatives. Most hedging of nondollar currencies against one another is done using the dollar as an intermediary. Dollarization eliminates one leg of each hedging transaction against nondollar currencies and the costs involved.

By reducing exchange risk, dollarization can *reduce the financial system's need for reserves*. The existence of a national currency in effect segregates payments in national currency from payments in

other currencies. As is known from the “square root law” of bank reserves, under certain realistic assumptions, commercial banks’ need for reserves only increases as the square root of their liabilities (Olivera 1971). Dollarization plus financial integration makes the financial system part of the worldwide pool of dollar liquidity, which is far larger than the pool of liquidity in, say, Mexican pesos. Moreno-Villalaz (1999) estimates that in the case of Panama, the financial system holds perhaps 3 percentage points of GDP less in reserves than it would if Panama were not dollarized.

For most developing countries, dollarization would *reduce inflation*, though the reduction in inflation in currency board countries would likely be very small because of the already low inflation in such countries. Studies of the relationship between inflation and economic growth have shown that high and even intermediate inflation is bad for growth (Dornbusch and Fischer 1993, Fischer 1993b, Bruno and Easterly 1998). In general, the more credible the disinflation program, the less costly it is. Official dollarization, like orthodox currency boards, provides a sufficiently credible break with past arrangements that it could minimize the costs of reducing moderate to low inflation. Note that dollarization does not imply the same rate of inflation throughout the common currency zone. Typically, countries or regions where economic growth is higher than average see their consumer price indexes rise faster than average, and those where growth is lower than average see their consumer price indexes rise more slowly.

The lack of domestic currency also implies a number of related benefits, which are detailed below. Because official dollarization would reduce inflation in most developing countries and eliminate devaluation risk, it would also *reduce real interest rates*, which contain premiums for expected inflation or devaluation. Nominal interest rates in Panama have persistently been the lowest or nearly the lowest in Latin America (Table 6). Real interest rates have also been relatively low and steady, avoiding the swings from negative to positive double digits that have occurred elsewhere in Latin America.

Financial markets in the U.S. dollar and euro, the two most likely currencies for countries considering official dollarization, are far deeper than those in any other currency. Dollarization can *make long-term financing available* where it currently is not. As mentioned above, Panama is the only Latin American country where 30-year fixed-rate mortgages are available in “domestic” currency (Hausmann et al. 1999). Similarly, 15–20 year mortgages are common in the Eastern Caribbean Central Bank countries that operate a quasi-currency board system.

TABLE 6  
 NOMINAL AND REAL BANK LENDING RATES IN SELECTED  
 WESTERN HEMISPHERE COUNTRIES (PERCENT)

Country	Period	Nominal Lending Interest Rate	Real Interest Rate
Argentina	1994–97	11.9	9.8
Bolivia	1991–97	50.4	41.7
Brazil	1995–97	35.3 <sup>a</sup>	6.4
Ecuador	1992–97	43.6	13.0
El Salvador	1992–97	18.1	7.4
Mexico	1993–97	32.5	1.3
Peru	1991–97	165.7	12.4
Venezuela	1992–97	35.4	-26.3
Panama	1991–97	10.7	5.7

<sup>a</sup>Money market rate.

SOURCE: International Financial Statistics, line 60b (money market rate), line 60p (lending rate), and line 64 (consumer prices).

Where inflation and nominal interest rates are very high, dollarization may *improve government finances* by increasing real revenue. Dollarization reduces the loss of purchasing power of taxes assessed now but paid later (a reverse Olivera-Tanzi effect). By eliminating the government's power to create inflation, official dollarization may *foster fiscal discipline* (Fischer 1982). Also, official dollarization may reduce the external cost of borrowing by reducing currency and country risks, thereby improving the fiscal position of a country.

Finally, in some cases official dollarization may have favorable *distributional benefits*. In the environment of a weak national currency, the young, financially sophisticated, and wealthy are often better able to preserve and expand their wealth during periods of high inflation than are the old (such as pensioners), the poor and, generally, people living on fixed incomes. Shifting assets from domestic currency to dollars, or among different kinds of investments in domestic currency, requires time and effort, and there is often a minimum threshold level of transaction, which leaves the poor the captive payers of inflation tax. Some kinds of investments that may have high yields, such as government securities, require a relatively high minimum investment and so are unavailable to most people in developing countries. People can still save by hoarding goods or dollar notes, but they earn no interest. Official dollarization ends these large redistributions of wealth that arise during high inflations.

## What Conditions Are Conducive to Official Dollarization?

### *Optimal Currency Area (OCA) Conditions*

A number of country characteristics affect the weighting of the costs and benefits just listed. Two important ones are the degree of unofficial dollarization and the conditions implied by the theory of optimum currency areas.

The higher the degree of unofficial dollarization, the lower the seigniorage a country earns from its domestic currency and, therefore, the lower is its potential loss from official dollarization. This consideration is particularly relevant in many developing countries where unofficial dollarization is high or increasing (e.g., Latin America). In such countries, the costs, measured as *flow cost* from official dollarization in terms of lost seigniorage would be small, unless monetary expansion and inflation are high.

The theory of optimum currency areas points to high factor mobility, symmetric shocks, and a relatively high degree of trade integration as factors that are conducive to official dollarization or other forms of a common currency (Mundell 1961). The original theory is silent on specifics that would make its application clearer, such as how much factor mobility and trade integration is enough to make an optimum currency area. Still, it strongly implies that an optimum currency area exists where there is a large country that has a dominant currency and where considerable trade and labor mobility exists between it and its smaller neighbors. These conditions broadly point to the U.S. dollar as the dominant currency in the Caribbean and Central America, and possibly throughout the Western Hemisphere. They also point to the euro as the soon dominant currency in Europe. (Euro notes will not circulate until 2002, so for the time being German mark notes are the most widely used currency, especially in Eastern Europe.)

Recent reassessments of the theory (see, particularly, Frankel and Rose 1997), however, suggest that the existence of a common currency itself strengthens the optimal currency area conditions by making the regions in a currency area more integrated over time. Optimal currency area conditions may well be endogenous to the type of monetary regime in a given area. This implies wider applicability of common currency areas than implied by the original statement of the theory. The successful movement of the 11 quite different European economies toward a common currency also seems to corroborate this idea, and may herald an era of wider monetary integrations around the dollar, euro, and yen as key currencies.

*Policy Constraints and Objectives*

A country's decision to officially dollarize depends on broad factors as well as narrow calculations of the quantifiable costs and benefits of seigniorage. The broad factors include how far a country wishes to become integrated into a wider currency and trade area, whether it seeks to impose discipline by eliminating discretionary monetary policy, whether it is seeking to break from a history of high inflation, the degree to which it views a domestic currency as an indispensable element of national sovereignty, and the government's perception of domestic political constraints on making foreign currency the only legal tender.

The mixture of factors will vary across countries. Generally, however, the tradeoff for smaller countries is between the elimination of the currency risk (including currency crises) and financial and trade benefits of integration into a dominant currency area on the one hand, and the political and economic costs of giving up a domestic currency on the other. Importantly, the decision to officially dollarize or not is political as well as economic, and in many cases political considerations outweigh purely economic ones. However, as globalization proceeds, the politics of monetary policy may shift from a stress on national sovereignty to a stress on regional integration, as has already happened in Western Europe. In countries that have forgone independent monetary policy—currency board countries—taking the final step by fully dollarizing may entail no additional loss of monetary sovereignty, except for the symbolism of the national currency.<sup>4</sup>

## Outlook for Official Dollarization in the Western Hemisphere

In important respects, the Western Hemisphere has long been a de facto U.S. dollar area. In many countries, the dollar is the main or an important unit of account, means of payment for large transactions, and a store of value. Residents of most countries in the hemisphere hold considerable amounts of dollar notes and bank deposits. Also, all economies in the hemisphere are already strongly influenced by economic conditions in the United States, through both current and capital accounts, so their degree of policy independence is limited. These initial conditions, combined with the historically contractionary

<sup>4</sup>For a description of how to dollarize a currency board system, see Schuler (1998), and Hanke and Schuler (1999). For a description of how to dollarize a central banking system, see Schuler (1999).

periods in the aftermath of devaluations in Latin America (Calvo 1999a), suggest that the costs of official dollarization may be relatively low, especially compared with countries that do not have a high degree of unofficial dollarization.

Given the general costs and benefits of full dollarization described above and recent economic developments, what are the prospects for official dollarization in the region? Proposals for official dollarization have been made in many countries from time to time, but have taken on a new importance today. Recent proposals (such as Cordeiro 1999) have been prompted by the experience of Argentina's currency board system and by financial crises in Mexico and Argentina in 1994–95 and in Brazil and Ecuador in 1999.

### *Ecuador*

Following Brazil's devaluation in January 1999, the Ecuadorian sucre came under increased speculative pressure. It was devalued on March 2. The same day, eight troubled banks closed. On March 11, the government froze deposits in the entire banking system. Discontent about the financial crisis and the state of the economy generally have created interest in the possibility of dollarization (Cordeiro 1999, Schuler 2000, IEEP 2000).

On January 9, 2000, President Mahuad announced official dollarization to end the rapid depreciation of the sucre. Political unrest caused the change in government on March 21 and the successor President Noboa has pushed forward the dollarization project. In February 2000, the government sent to parliament a comprehensive set of laws inaugurating the new monetary system based on the U.S. dollar and a number of structural reforms. The government has also announced that it may take six months to implement official dollarization, which would make Ecuador the world's largest officially dollarized country. The proposal includes provisions for Ecuador to maintain the parallel circulation of sucre coins and lower-denomination banknotes issued by a currency board at par with the U.S. dollar. Thus far, the currency reform could be termed a success. However, fiscal adjustments and further banking reforms are necessary to reap the full benefits of the new monetary system.

### *Argentina*

The Convertibility Plan of 1991 established a currency board-like system. Argentina was heavily dollarized unofficially when the plan went into operation: U.S. dollar notes were estimated to exceed domestic currency notes and bank deposits combined. Under the cur-

rency board-like system, unofficial dollarization, as measured by the share of foreign currency deposits to the broad money supply, has been high—44 percent in 1995 (Baliño et al. 1999: 2, Table 1). Also, the share of foreign currency deposits has increased even since the Convertibility Plan began, suggesting that the process may be irreversible. Far from hindering use of the dollar, Argentina has encouraged it by giving the dollar practically legal tender status in large classes of transactions. The dollar is widely used as a unit of account and means of payment in private financial transactions, although the government uses the peso as its sole unit of account.

In January 1999, President Carlos Menem announced that the government was studying the possibility of full official dollarization. He was prompted to do so by lingering doubts about the credibility of the currency board-like system. Despite the system's good performance, Argentina has experienced interest-rate spikes in 1992, during Mexico's currency crisis in 1994–95, and during the Asian and Brazil currency crises since 1997. When the Mexican crisis spilled over and created speculative pressure against the Argentine peso in 1995, the Argentine government threatened to officially dollarize, which helped reduce the pressure. Given that the Argentine peso is worth one dollar, moving from the present currency board-like system to official dollarization would not be technically difficult (Hanke and Schuler 1999), but it entails other considerations such as seigniorage sharing that may require prolonged bilateral negotiations and treaties (Joint Economic Committee 2000). The continued rise in unofficial dollarization indicates that the lost seigniorage is smaller than it would be in, say, South Korea, which is not heavily dollarized unofficially.

The flow seigniorage cost of dollarization is the lowest in Argentina from among a group of countries in the region—0.5 percent of GDP per year. And it could be reduced further if Argentina reaches an agreement with the United States on seigniorage sharing. The remaining primary concerns on the cost side are the lender of last resort function and the threat of an extreme depression that may require a reintroduction of currency. As far as the lender of last resort is concerned, contingent credit lines, bilateral or multilateral support, and the strong presence of foreign banks would all tend to minimize the threat of collapse of the system under extreme circumstances. Under conditions as during the Great Depression, however, exit from the system would be difficult.

On the benefit side of the equation, the principal gains, as outlined above, would be permanent elimination of the currency risk (and the risk of currency crises) and, therefore, a further decline in Argentina's interest premium over the United States, and tighter financial inte-

gration. Assuming that the important component of Argentina's high interest rates is due to devaluation risk as opposed to real or fiscal uncertainty, Borensztein and Berg (2000) estimate that full dollarization could bring about benefits in terms of lower spreads that would amount to 1 percent of GDP. The associated benefits of tighter trade and financial integration, and greater fiscal- and financial-sector discipline, perhaps due to improvements in supervision and regulation, would be expected to become important in the long run.

### *Brazil*

Brazil's current economic program uses a floating exchange rate and budget cuts to restore some of the credibility the *real* has lost during the crises. Critical to the success of the program will be the government's ability to stick with fiscal adjustment, and the path of real interest rates that results from the market's perception of government policies. The government has shown no intention of fully dollarizing the system.

### *El Salvador*

The Salvadoran colón was pegged at 2.50 per U.S. dollar for a half-century before being devalued in the 1980s, in the midst of a lengthy civil war. It was stabilized at 8.75 per dollar in 1992 and has remained at that rate since. In 1994, even before Mexico's currency crisis, the Salvadoran central bank and government considered establishing a currency board to ensure that the colón would not be devalued again. In 1995 the government took a step beyond and announced that it intended to officially dollarize El Salvador. Later it dropped the plan in the face of opposition at home to eliminating a symbol of national identity; and international financial institutions were reported to have claimed that El Salvador's economy and fiscal situation were not healthy enough for dollarization (Chronicle of Latin American Affairs 1995). In early 1999, President Armando Calderón Sol reiterated interest in official dollarization, after debate on the subject in Argentina brought it into the news. Since President Calderón Sol left office in June, he has left it to his successor to decide whether to pursue official dollarization. Most recently, on November 22, 2000, President Francisco Flores announced the decision to dollarize.

### *Mexico*

Since its 1994 currency crisis, prominent Mexican and foreign figures have debated suggestions that Mexico establish a currency board

or dollarize. While it has not been considered widely in policy circles, recently, a number of Mexican businessmen and trade associations have expressed support for full dollarization (Tricks 1999). Among the foreign economists, Dornbusch (1997) has argued for official dollarization rather than a currency board on the grounds that Mexico has less credibility in monetary policy than does Argentina.

### *Peru*

There is some interest in official dollarization in Peru, which ended a hyperinflation in the early 1990s but has had recurring problems with exchange rate depreciation. Peru has extensive unofficial dollarization: 64 percent of the broad money supply is held in U.S. dollar deposits (Baliño et al. 1999: 2, Table 1).

Finally, in several *Caribbean countries* the U.S. dollar is already widely used by central banks as a reserve currency and by the public as a store of value. Also, Eastern Caribbean Monetary Union, Cayman Islands, and Bermuda operate currency board-like systems. The small size of Caribbean economies and their generally low levels of monetary expansion and inflation suggest that the costs of official dollarization would not be unduly high. However, more powerful than the quantifiable costs for encouraging official dollarization will be the likely tendency of greater economic integration in the Western Hemisphere around the U.S. dollar as the key currency.

To summarize, in the Western Hemisphere, initial conditions with high unofficial dollarization, periodic currency crises, and the generally good performance of the Argentine currency board-like system and Panama's experience with full dollarization have revived interest in monetary unions, including its ultimate form: official or full dollarization. The issue has emerged as a topic of lively debate in Argentina and El Salvador and elsewhere. In the end, the outcome of Ecuador's dollarization and the ongoing discussion on officially dollarizing Argentina will likely serve as landmarks, leading either to a further rise or a decline in the interest of other countries in the region.

## Conclusion

The advent of the euro and recent currency crises affecting exchange rates other than those that are floating or firmly fixed, often in the form of currency boards, have brought official dollarization into the spotlight. Previous analyses suggested that the costs of official dollarization were high. But in recent decades, extensive unofficial

dollarization, financial innovations that lead to a lower currency-to-GDP ratio and greater use of noncash forms of money, and lower monetary growth and inflation in many countries have reduced the potential costs of full dollarization. Using several countries in the Western Hemisphere as examples, we have shown that these costs may be relatively low (as in Argentina). Initial conditions including the already high unofficial dollarization in many Latin American countries and multiple benefits arising from the elimination of the domestic currency risk, while difficult to quantify, suggest that the balance on full dollarization may be more favorable than it was several decades ago.

We have also discussed broader factors that are likely to influence countries where official dollarization is now being debated. The worldwide trend toward greater regional integration bodes well for full dollarization, because it reduces the perceived loss of national sovereignty from adopting a foreign currency. On the basis of that trend, we would expect some rise in the number of economies officially using the U.S. dollar, the European euro, and perhaps the Japanese yen.

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