

International Currencies and National Monetary Policies

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Occasional Paper 72

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Abstract

How does the use of international currencies such as the dollar, the euro, and the yen in emerging markets for a range of local transactions affect the monetary and financial policies of central banks and governments? This paper explores this question, based on a survey by the Conference Board of some 2,600 firms in a range of countries, an extensive literature review, and theoretical analysis. It argues that neither theory nor evidence suggests that the use of international currencies by agents active in developing economies requires policymakers to fundamentally rethink the formulation and conduct of monetary policy. The paper discusses various policy options for encouraging greater use of the local currency.

Introduction

In 2004 the Conference Board published the results of a survey of some 2,600 firms in a range of countries, inquiring into the use of both local currencies and the principal international currencies: the dollar, the euro, and the yen (Conference Board 2004). (Figure 1 presents the national composition of the survey.) The study found that the stability of local currencies and the liquidity of local financial markets mattered for firms' decisions regarding the location of production and investment, but that firms used various techniques to minimize these impacts. Those techniques ranged from employing financial markets and instruments to hedge local currency exposures to using the dollar and the euro in transactions outside the United States and the euro area.

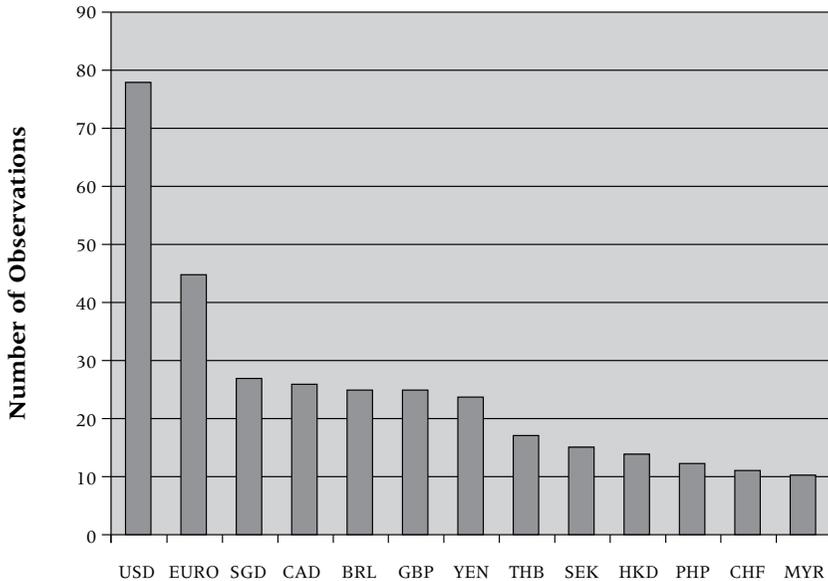
While this survey evidence is a source of valuable detail, the phenomenon it identifies—the use by corporations of foreign currencies and derivative instruments based on foreign currencies—is neither new nor unfamiliar. At least four earlier sets of literature speak to these issues.

The first set of literature considers *exchange rate volatility and investment*. Authors like Goldberg (1997) examine the impact of exchange rate levels and volatility on investment. Lurking behind the negative correlation between exchange rate volatility and investment for some sectors and countries is the idea that volatility raises uncertainty about the cost of imported inputs and/or the value of export sales, together with the presumption that this uncertainty is discouraging for investment.

A larger literature considers the impact of exchange rate volatility on foreign direct investment (FDI). Authors like Cushman (1985, 1988)

FIGURE 1. HOME COUNTRY CURRENCY

Q5: What is your home country currency?



Source: Conference Board (2004).

Note: - Included currencies: American Dollar (USD), the Euro, Singapore Dollar (SGD), Canadian Dollar (CAD), Brazilian Real (BRL), British Pound (GBP), Japanese Yen (Yen), Thai Baht (THB), Swedish Krona (SEK), Hong Kong Dollar (HDK), Philippine Peso (PHP), Swiss Franc (CHF), Malaysian Ringgit (MYR).

- Total number of observations = 372. Some observations record more than one currency as home country currencies.

- Currencies with fewer than 10 responses are excluded from the figure. They are Australian Dollar (AUD), Chilean Peso (CLP), Chinese Yuan (CNY), Danish Krone (DKK), Indonesian Rupiah (IDR), Indian Rupee (INR), Korean Won (KRW), Mexican Peso (MXN), Norwegian Krone (NOK), Polish Zloty (PLN), Turkish Lira (TRL), and Taiwan Dollar (TWD).

and Goldberg and Kolstad (1995) find a positive impact of exchange rate volatility on foreign investment, which they explain on the grounds that foreign direct investment allows multinational companies to diversify away some of the market-specific effects of currency volatility. When a change in the exchange rate between two currencies raises costs of production in one of the two issuing countries, it lowers costs of production in the other. Firms thus reap benefits from possessing a diversified portfolio of production locations.¹

1 The Conference Board survey (2004, p. 31) similarly found that these global-pooling strategies are popular among multinational companies, especially those operating in Latin America, Japan, and developing Asia. That pooling is the preferred response of firms operating in emerging markets makes sense insofar as the alternative of financial hedges is often too expensive or unavailable. On the other hand, the survey also found that very few companies invest in a country simply to diversify exchange rate exposure.

In contrast, other authors, such as Urata and Kawai (2000) and Benassy-Quere, Fontagne, and Lahreche-Revil (2001), find a negative impact of exchange rate volatility on foreign direct investment (FDI), which they explain in terms of the tendency for uncertainty to discourage investment generally.

More broadly, one would expect both effects to be present. Not surprisingly, recent studies informed by these earlier literatures (Kiyota and Urata 2004; Ho 2005) find that the sign of the effect differs across countries and industries.

The second set of literature considers *currency substitution*: that is, the use of international currencies for effecting payments in third countries. (The seminal contribution here is Ortiz 1983.) Traditionally, currency substitution is prevalent under conditions of high inflation, when using the domestic currency is costly and there is reason to look to alternatives (see Calvo and Vegh 1992). It typically results from monetary policy problems rather than producing them, although currency substitution can limit the seignorage revenue accruing to the central bank and provide an incentive for revenue-constrained governments to press for surprise inflation.

The third set of literature considers *de facto* and *de jure* dollarization. (A non-technical survey is Chang 2000.) *Dollarization* refers to the practice of issuing assets and liabilities denominated in dollars and international currencies, generally in preference to assets and liabilities denominated in local currency.² Such assets and liabilities include not just currency itself (as in the literature discussed in the preceding paragraph) but also dollar-denominated deposits in the domestic banking system and cross-border deposits held by residents in banks abroad.³

De facto dollarization refers to the spontaneous tendency for market participants to accumulate claims in this form as a way of protecting themselves against market and policy-related risks. *De jure* dollarization occurs when the national authorities recognize an international currency as legal means of payment and unit of account for contracting among private parties and paying taxes and in the limit when they abolish the domestic currency. The debate here centers on whether the credibility benefits of the adoption of this monetary regime exceed its costs, which take the form of loss of autonomy in monetary policy.

2 Use of “dollar” is to be understood as generic (here, as in the bulk of the literature).

3 Thus the issues with which the literature on currency substitution is concerned can be seen as a subset of the issues addressed by the more recent literature on dollarization.

The fourth set of literature considers *hedging by nonfinancial firms*. This work grows out of the financial crises of the 1990s, events that were aggravated by the existence of currency mismatches on the balance sheets of firms, households, and governments (Goldstein 1998). One relevant strand of scholarship analyzes the extent of hedging by financial and nonfinancial firms: whether, and, if so to what extent, firms use financial derivatives and natural hedges to limit their vulnerability to currency mismatches (see Bleakley and Cowen 2002; Arteta 2004). Another strand investigates policies that might be used to encourage hedging, ranging from greater exchange rate flexibility to more intense prudential supervision and regulation (Goldstein and Turner 2004). Still another strand asks how monetary and exchange rate policies are affected by the existence of these foreign currency exposures (Hausmann, Panizza, and Stein 2001; Calvo and Reinhart 2002).

The first of these sets of literatures, on exchange rate volatility and investment, focuses on the allocation of real resources such as investment capital by individual firms. The last of the four is concerned with individual decisionmaking by firms: mainly their financial decisions. The intervening literatures on currency substitution and dollarization, in contrast, are macroeconomic in orientation. They are concerned with the implications of asset and currency substitution for the aggregate economy, and specifically for inflation, the counter-cyclical stabilization function of monetary policy, and the lender-of-last-resort capacity of the central bank.⁴

What is missing is an analysis that ties these elements together, connecting the use of international currencies by firms, banks, households, and others—and their implications for investment behavior—to the effectiveness of the monetary and financial policies of central banks and governments. Such analysis would focus on issues such as the following:

- Monetary policy can affect economic activity either through the cost of capital (the interest rate channel) or the availability of finance (the credit channel). Does the use of international currencies by domestic firms, or the use of international currencies by international firms, influence the operations of these channels—and thus the effectiveness of monetary policy?

4 The earlier literature on currency substitution focused heavily on implications for inflation, while the more recent literature on de facto and de jure dollarization has been more concerned with those for financial stability.

- The use of international currencies in domestic transactions is an endogenous behavioral response. It depends on the stability of currency values, but also on the depth and liquidity of markets in financial assets and liabilities denominated in the domestic currency. The size and quality of those markets plausibly influences the financing decisions of domestic and international firms. What is known about the policies that countries can follow to encourage development of those markets? Specifically, are certain monetary and exchange rate policies more conducive than others to the development of markets in claims denominated in local currency?
- Finally, it is sometimes asked whether widespread use of the dollar and the euro in third countries should influence the monetary policy decisions of the Federal Reserve Board and the European Central Bank (ECB). Are there circumstances where the central bank issuing the currency used internationally should wish to take third country use into account when formulating monetary policy?

The finding of the Conference Board survey and the surrounding literature that multinational firms, domestic resident firms, households, and governments all use international currencies such as the dollar and the euro for a range of local transactions would seem to pose a challenge to the conventions guiding and informing the conduct of monetary policy—including the basic presumption of stable relationships between money and output and between domestic interest rates and investment. If entities active in the economy, including but not limited to internationally active firms, use international currencies in domestic transactions, one might ask, then how is the central bank supposed to use domestic monetary instruments to control inflation and achieve the other targets of monetary policy?

This paper argues that these arguments are overblown. In fact, neither theory nor evidence suggests that the use of international currencies by agents active in developing economies (where the practice is most prevalent) requires policymakers to fundamentally rethink the formulation and conduct of monetary policy. To be sure, the use of international currencies is a source of complexity. In particular, it creates additional concerns regarding financial stability. It is important that these additional complications and risks be taken into consideration, but under most circumstances they do not undermine the conventional foundations of monetary policy.

Specifically, neither theory nor evidence suggests that the use of international currencies interferes significantly with the ability of the central bank to maintain a low and stable rate of inflation, the task that is conventionally regarded as its paramount policy goal. Unpredictable shifts between domestic and foreign currency deposits (or between sources of investment funding denominated in domestic and foreign currency) may strengthen the argument for focusing on broad monetary aggregates that include foreign currency deposits (or broad credit measures that include foreign currency loans), rather than narrow ones. They may strengthen the argument for using targeting rules rather than instrument rules. But they do not fatally undermine the central bank's ability to exercise inflation control.

The case for skepticism is strongest when the entity using the international currency for local transactions is an internationally active firm—as in the case highlighted by the Conference Board survey. Here the implications for financial stability are likely to be less. Internationally active firms are in a particularly favorable position to hedge foreign currency exposures. The danger that their financial condition will be terminally damaged by exchange rate changes induced by the policies of the host-country central bank is quite limited. Given that they have no reason to keep their books in the currency of the host country, the possibility that they will shift unpredictably from foreign to domestic currencies is relatively limited.

As with many issues in economics, it is possible to imagine special cases in which a phenomenon—in this case, the use of international currencies—has truly earth-shattering consequences. In the current context, the analytical literature suggests that the capacity of monetary policy to stabilize output may evaporate entirely when international currency use—and liability dollarization in particular—reach very high levels. However, evidence on the implications for output stabilization is less clear cut. While some studies find that output is more volatile where international currency use is extensive, others do not. This is perhaps unsurprising, given that the evidence on the efficacy of monetary policy for stabilizing output is mixed in general.

Following an overview of the use of international currencies, the remainder of the paper develops these arguments as follows. The paper considers the implications of the use of international currencies for the practice of monetary policy in emerging markets and suggests a number of reasons why national authorities may be more comfortable when it

is the local currency that is predominantly used in local transactions. This leads to a discussion of policy options for encouraging greater use of the local currency. The paper then considers whether the use of their currencies in international transactions has implications for the conduct of monetary policy in the issuing countries. The final section summarizes the conclusions and suggests some directions for future research.

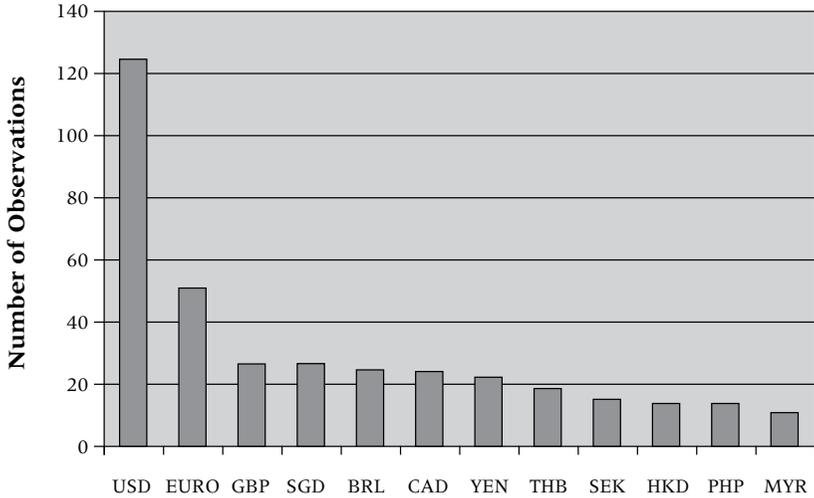
The Use of International Currencies in Local Transactions

“International currency” is used in this discussion to denote a currency that is widely used in transactions outside the borders of the issuing country. The designation as “international currency” has multiple dimensions. Standard treatments in the literature distinguish the role of international currencies in national and international transactions. In national (domestic) transactions, they further distinguish the use of international currencies in payments (the phenomenon known as *currency substitution*) and as a store of value (the phenomenon known as *asset substitution*). In international transactions, they distinguish the use of international currencies for invoicing exports and imports, for settling international transactions, and as a form in which to hold foreign reserves. This paper is concerned with all these dimensions of international currency status.

International currencies are used extensively in local transactions in many countries. The Conference Board survey found that such currencies, especially the dollar, are widely used for financial reporting, pricing, sourcing, performance and budgeting by international corporations. A comparison of figures 1 and 2 clearly shows the disproportionate use of the dollar in financial reporting. Figure 3 shows that the dollar is also widely used for pricing and sourcing by firms headquartered outside the United States. The euro and the yen are also used, but to a much lesser extent (see also figure 3 and figure 4, panels a through e). Overall, non-home currencies are mainly used for pricing and sourcing; they are less used for other corporate functions (see figure 5).

FIGURE 2. CURRENCIES USED FOR FINANCIAL REPORTS

Q6: Which currencies do you use for financial reports?

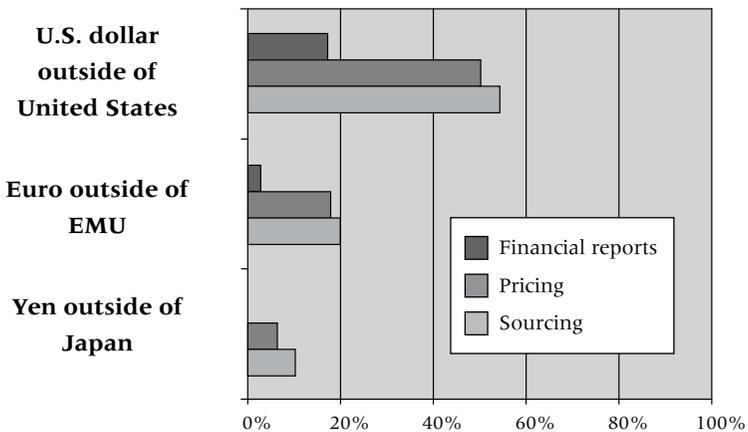


Source: Conference Board (2004).

Note: - Total number of observations = 372.

- Many respondents reported that multiple currencies are used for financial reports.
- Answers such as “local,” “foreign,” “various,” or other unidentifiable currency units are dropped from the sample.
- Currencies with fewer than 10 responses are excluded from the figure. They are ARS, AUD, CHF, CLP, DKK, ESP, IDR, INR, KRW, MEP, MXN, NOK, NZD, PLN, SAR, SID, TRL, and TWD.

FIGURE 3. MEDIUM OF EXCHANGE FOR GLOBAL BUSINESS TRANSACTIONS



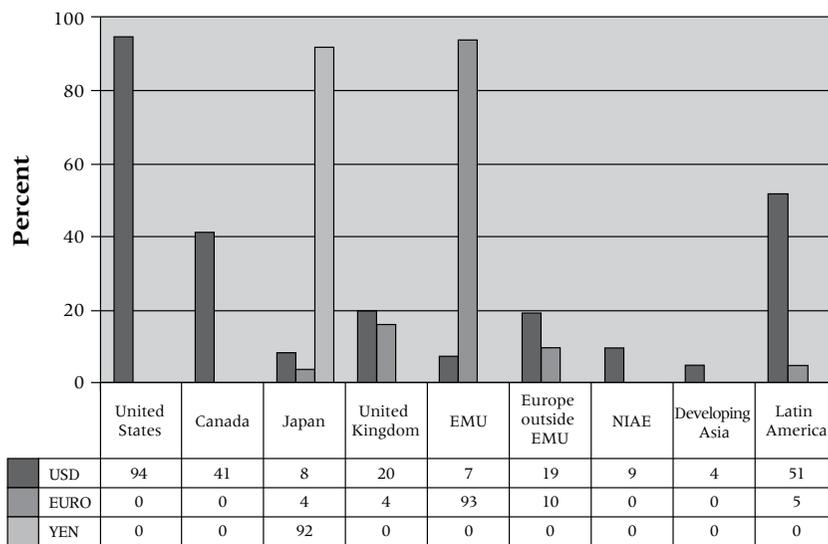
Source: Conference Board (2004).

Note: The figure presents answers to Questions 6a, b, and c, Section II (page 62).

FIGURE 4. IMPORTANCE OF THE MAJOR CURRENCIES FOR COMPANIES (VARIOUS MEASURES)

a. Companies' Financial Reports

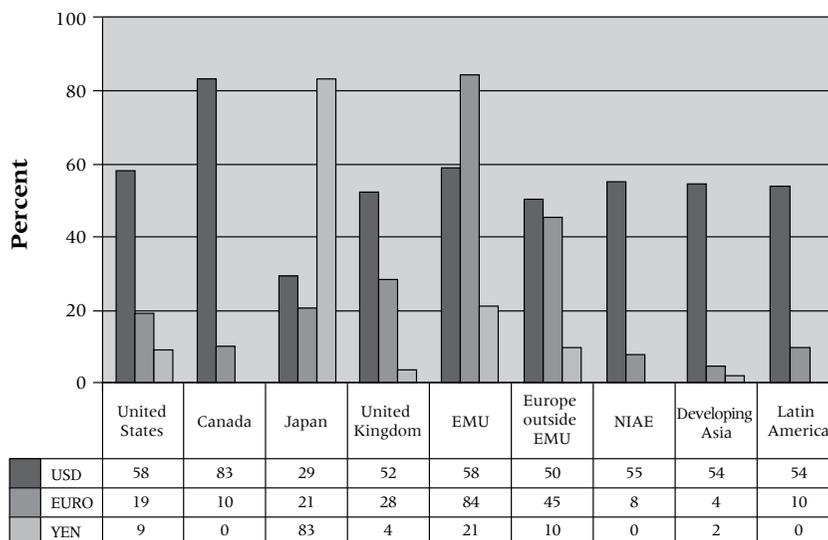
Percentage share of each currency in regional/country subsample



Source: Conference Board (2004).

b. Companies' Pricing

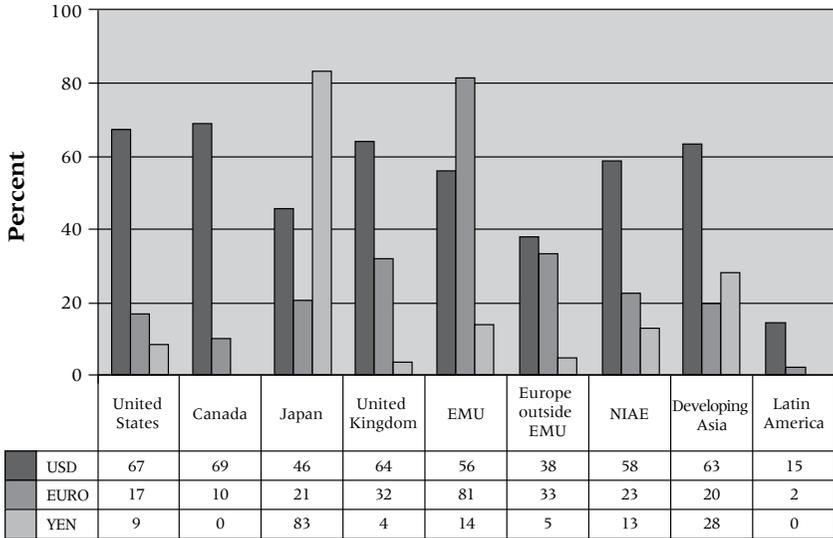
Percentage share of each currency in regional/country subsample



Source: Conference Board (2004).

c. Companies' Sourcing

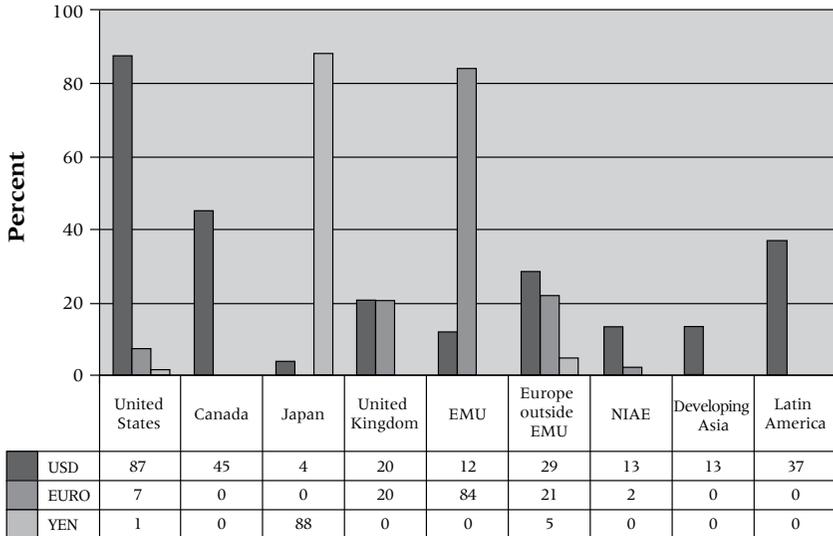
Percentage share of each currency in regional/country subsample



Source: Conference Board (2004).

d. Companies' Use of Currencies

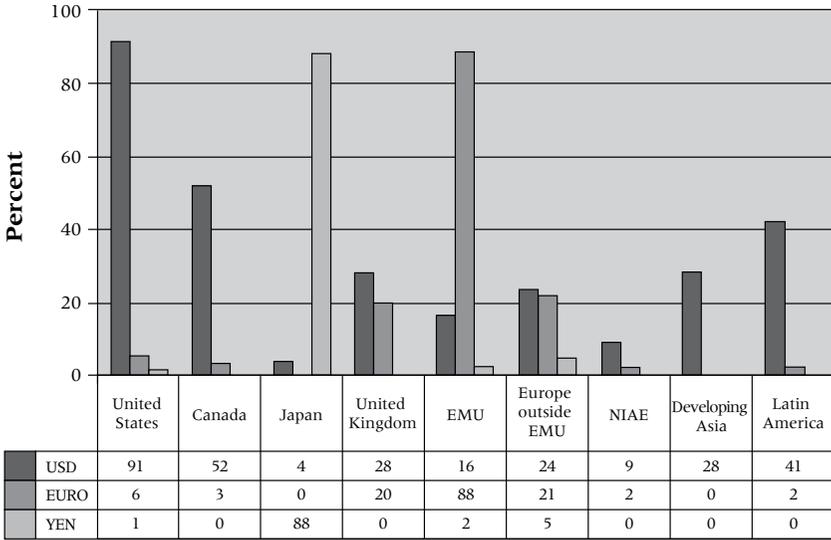
Percentage share of each currency in regional/country subsample



Source: Conference Board (2004).

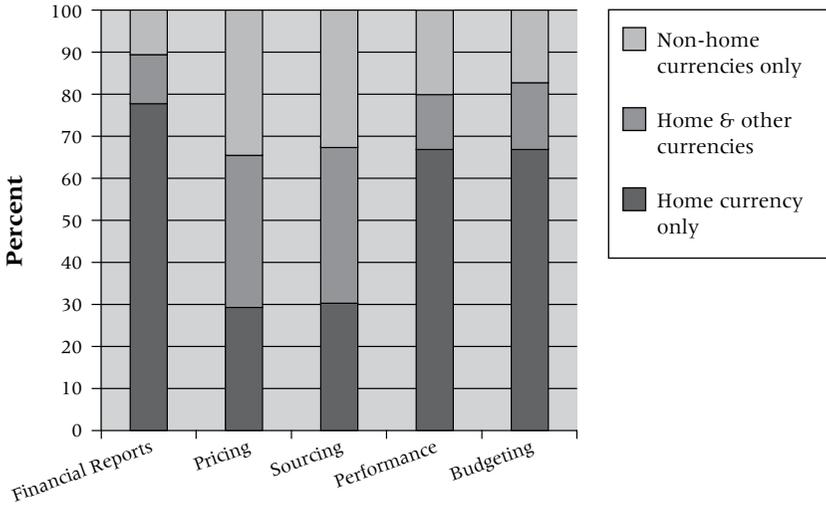
e. Companies' Budgeting

Percentage share of each currency in regional/country subsample



Source: Conference Board (2004).

FIGURE 5. MEDIUM OF EXCHANGE FOR BUSINESS TRANSACTIONS: HOME VS. NON-HOME CURRENCIES



Source: Conference Board (2004).

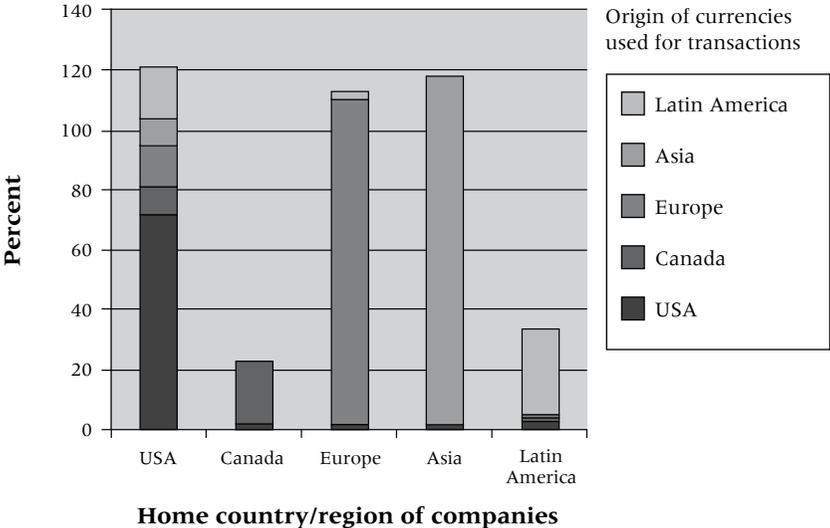
Note: - Total observations = 372 companies.

- The three categories of currency choices are mutually exclusive.

The use of international currencies (“dollars”) by international corporations is only one aspect of the general practice of using dollars in developing countries and emerging markets, as shown in figure 6 (panels a through e). The share of dollar-denominated deposits and loans is 22 percent and 19 percent, respectively, in emerging markets outside Latin America, and 37 percent in 39 percent in Latin America, Galindo and Leiderman (2004) report. In some countries, such as Bolivia, Costa Rica, Nicaragua, Paraguay, Peru, and Uruguay, more than half of deposits and loans are denominated in dollars. In extreme cases like Bolivia, dollarization of the financial system is all but complete. Similarly, government liabilities (both domestic and external debt) are heavily dollarized in Latin America and also significantly dollarized in other emerging markets (where more than a third of all public debt is denominated in foreign currency).⁵

**FIGURE 6. CROSS REGIONAL-USE OF CURRENCIES
(VARIOUS MEASURES)**

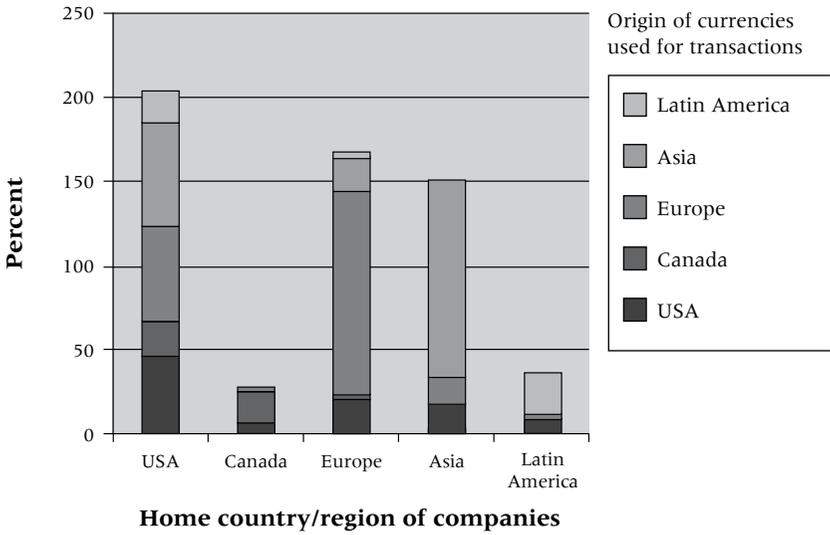
a. Financial Reports



Source: Conference Board (2004).

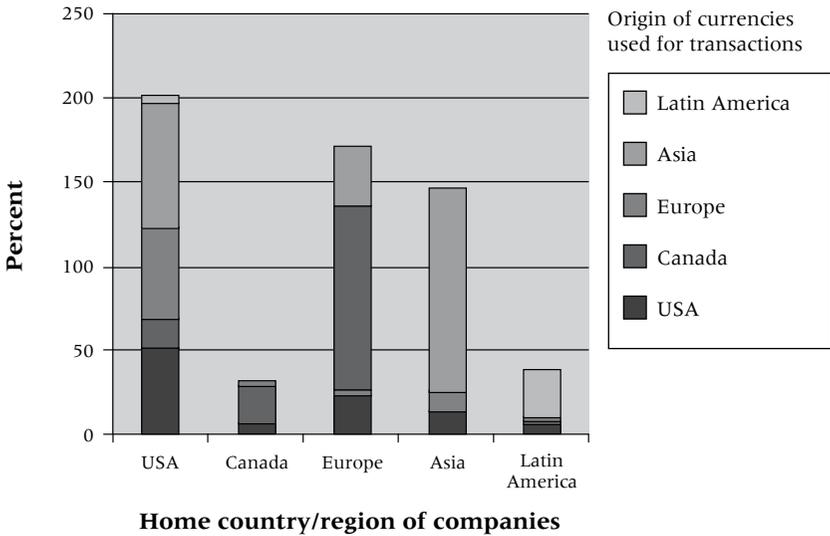
5 There has been significant movement away from this practice in some countries such as Brazil in recent years. This will be discussed further below.

b. Pricing



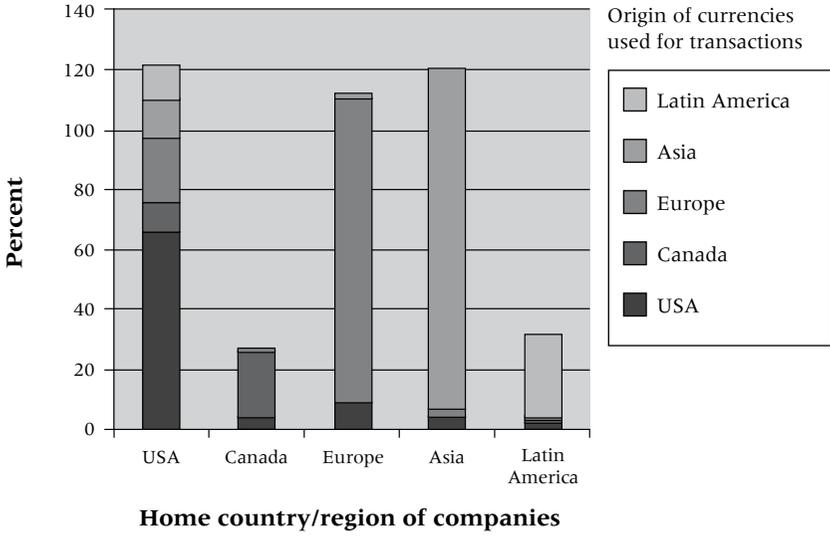
Source: Conference Board (2004).

c. Sourcing



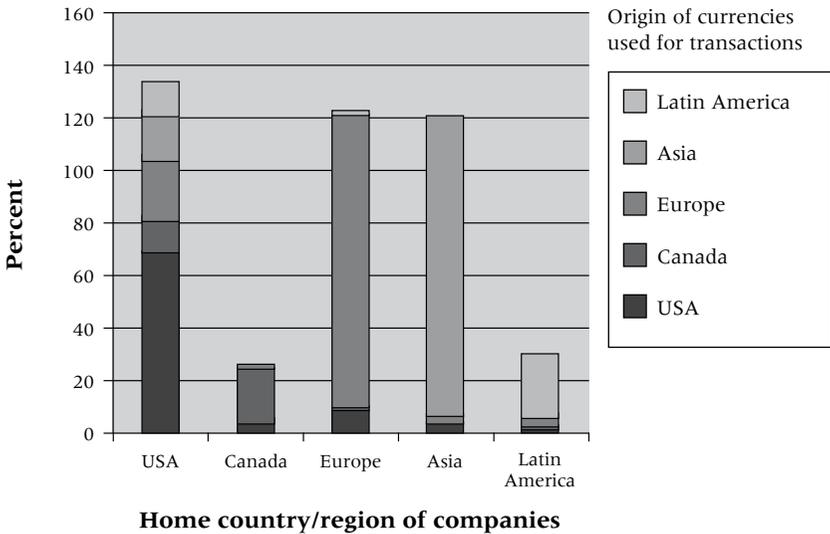
Source: Conference Board (2004).

d. Performance



Source: Conference Board (2004).

e. Budgeting



Source: Conference Board (2004).

Reinhart, Rogoff, and Savastano (2003) add more granularity to this picture by considering a larger sample of countries and a wider range of assets and liabilities. They find that the intensity and breadth of usage of international currencies for transactions in developing countries has risen significantly since the early 1980s. The dominant factors driving this increase have been the rising dollarization of bank deposits and the increased use of dollar-denominated and dollar-linked domestic debt by governments. In the 1980s, less than 10 percent of the countries considered by these authors had more than a low level of dollarization (defined as more than 10 percent of money and domestic public debt denominated in or linked to a foreign currency). By the 1980s, more than half of developing countries for which data are available exceeded this threshold.

Paralleling broader changes in international financial markets, the identity of the agents incurring dollar liabilities has also changed. In the 1980s liability dollarization predominantly reflected external dollar borrowing by governments. More recently it has reflected borrowing and lending not only by governments but by banks and corporations, domestically as well as abroad.

Thus the Conference Board's data suggest that the use of international currencies is widespread. Other data drawn from bank regulators, corporate financial statements, and national accounts similarly suggest that this practice is widespread by local firms and households as well, for purposes of financial reporting, pricing, sourcing, performance, and budgeting.

Monetary Policy When Agents Use a Foreign Currency

The bulk of the literature suggests that widespread use of the dollar in emerging markets for denominating debt instruments, storing wealth, and invoicing and settling transactions does not have first order implications for monetary policy—although it does have a variety of subtle implications relevant to the nuts and bolts of policy formulation. To focus thought, consider the following very simple model of the economy:

$$Y = C + I + G \quad (1)$$

$$I = I_D(-r) + I_F(-r^*) \quad (2)$$

Here monetary policy operates through the impact of interest rates on investment, I . Consumption C and government spending G are exogenous. The central bank sets the domestic interest rate r to strike the appropriate balance between minimizing the output gap and avoiding excessive inflation.⁶ In this economy, two types of firms undertake investment. (Alternatively, one may think of firms undertaking two types of investment or of them utilizing two types of funding to finance their investment.) A fixed fraction of firms fund their projects by borrowing in pesos, while the remaining fraction fund their projects by borrowing in dollars. For the first (second) group, the cost of capital is a function of

6 One could formalize this part of the model by assuming that inflation depends on the level of output, $\pi = \alpha(Y)$, and that the central bank seeks to minimize deviations of output and inflation from their respective target levels.

the peso (dollar) interest rate r (r^*). The peso interest rate is set by the local central bank; the dollar interest rate is set by the Federal Reserve. For the time being, linkages between the two interest rates are ignored. These will be introduced momentarily.

In this model, the fact that a fixed share of investment projects is funded in dollars does nothing to weaken monetary control. The central bank may have to raise or lower the domestic interest rate r by a greater amount to achieve the same change in aggregate demand, given that some share of investment is unresponsive to its policy rate. But the capacity of the monetary authorities to minimize deviations of inflation and the output gap from target levels is undiminished. The effectiveness of monetary policy, so defined, is not affected.

These strong conclusions are subject to a number of qualifications. For example, there may be unpredictable shifts in the extent of reliance on foreign currency funding. Empirical studies do not, however, suggest that such problems seriously weaken the effectiveness of monetary control. Galindo and Leiderman (2004) show that central banks have succeeded in bringing down inflation across Latin America irrespective of the extent of dollarization. They find that differences in inflation rates and in the extent of disinflation are not correlated with the level of dollarization. Reinhart, Rogoff, and Savastano (2003) similarly detect no correlation between the extent of dollarization and the extent or durability of disinflation. They do report some evidence that the average inflation rate is higher and more variable in countries with a high level of dollarization. The question, of course, is whether dollarization is a cause or simply a consequence of this last pattern. In addition, the findings of Reinhart, Rogoff, and Savastano (2003) hinge on including countries with exceptionally high inflation rates, in which both domestic and external liabilities are heavily dollarized—which underscores the question of causality.

These studies also consider output growth and its volatility. Here the evidence, as noted, is less clear cut. Galindo and Leiderman (2004) find little evidence that the level or volatility of GDP growth—which may be affected by monetary policy among other factors—behaves differently in more and less dollarized Latin American economies. On the other hand, Reinhart, Rogoff, and Savastano (2003) do find some evidence of a relationship between the extent of dollarization and output volatility: that is, that volatility tends to be higher where external liabilities are heavily dollarized.

Other reasons for questioning the irrelevance of the use of international currencies for domestic monetary policy include the possibility of erratic shifts in the share of firms financing their projects in dollars, and more generally of those using the dollar in transactions. In this case, the link between the policy instrument of the domestic monetary authorities and their targets (here inflation, investment, and aggregate demand) may be rendered less reliable, which in turn may have implications for the optimal operating strategy for monetary policy. If the authorities prefer to retain a monetary aggregate as their intermediate target, it may then make more sense for them to adopt a broad aggregate that includes foreign currency deposits.⁷ More generally, any instrument rule may be rendered problematic by unpredictable financial innovation that disrupts the links between the financial variables constituting the central bank's intermediate targets and its ultimate goals, creating an argument for moving to a targeting rule (Svensson 2005). Hence there is an argument for central banks in relatively heavily dollarized economies to consider goal targeting rather than instrument targeting—and inflation targeting rather than monetary aggregate targeting in particular, insofar as erratic shifts between domestic and international monies destabilize the links between monetary aggregates on the one hand and inflation and output on the other. This may be part of the explanation for why several heavily dollarized emerging markets have moved toward inflation targeting in recent years. However, Reinhart, Rogoff, and Savastano (2003) do not find that the velocity of circulation of the monetary base is more volatile in more heavily dollarized economies. This suggests that dollarization per se may not be the dominant explanation for the rise of inflation targeting, which has also become fashionable in other economies, such as Sweden and the United Kingdom, where dollarization is not widespread.

Insofar as investment is a proxy for and a determinant of firm value and profitability, the authorities may also worry that their policy has undesirable distributional consequences. If r is used actively for inflation and output stabilization but r^* does not vary (or does not vary commensurately), investment planning will be more difficult for firms borrowing in pesos. If peso interest rates must be kept higher than dollar interest rates, firms able to fund their projects by borrowing in dollars will have a competitive advantage. Insofar as these firms are unevenly

7 Berg and Borensztein (2000) provide some evidence supporting this idea.

distributed across sectors (or by home country, when international firms are present), there may be reason to worry about incidence. Specifically, there may be reason to worry that monetary tightening will disproportionately impact small firms and enterprises operating in the non-traded goods sectors, insofar as these have least access to foreign currency funding.

In practice, the costs of borrowing in pesos and in dollars may not be independent. A benchmark simple case is where all financing is sourced at home but some of it is denominated in dollars and an interbank market exists. Banks lend in both dollars and in pesos, while bondholders are willing to buy bonds denominated in both dollars and pesos. Banks set lending rates on dollar- and peso-denominated loans so as to regulate the demand and balance their portfolios between the two types of assets. When the central bank raises the rate at which it discounts peso paper, the lesser availability of credit will translate into an increase in the interest rates charged on peso loans. Borrowers will switch toward dollar loans, driving up the demand for dollar loans as well. Banks, for their part, will shift some of their fungible resources from dollar to peso loans, reducing the supply of dollar loans. For all these reasons, increases in the price at which the central bank will discount peso claims (provide peso credit) will increase the price of not just peso loans but also dollar loans.

This merely changes the magnitude of the output response to a given change in policy rates without fundamentally altering the policy environment. At this level of abstraction, the fact that funding costs for firms borrowing in dollars and borrowing in pesos are not independent of one another still has no strong qualitative implications for the conduct of monetary policy.

The opposite case is where peso loans are sourced at home but dollar loans are sourced abroad, and banks providing loans at home cannot fund themselves abroad. Domestic monetary tightening once again raises domestic interest rates relative to foreign rates. In the typical model, emergence of this differential is accompanied by appreciation of the currency. (In the overshooting variant, some of the initial appreciation is given back subsequently, consistent with higher interest rates at home than abroad and the maintenance of interest parity.) Thus, in addition to worrying about the impact of higher interest rates on investment by firms funding themselves in pesos, the central bank will have to take into account the impact of a stronger exchange rate on firms'

competitiveness and export revenues, since the combination of higher funding costs and reduced foreign sales may be lethal for firms in the export sector. On the other hand, to the extent that exporting firms finance capacity expansion by borrowing abroad, in dollars—which is what empirical studies tend to suggest—the two effects will offset: the reduction in the peso value of exports will be matched by a reduction in the peso cost of servicing dollar debt. To put it another way, these firms are naturally hedged.

These remarks point to the general observation that widespread use of the dollar in domestic transactions may heighten financial fragility, amplifying output volatility and complicating the central bank's role as lender-of-last resort. Firms may borrow in dollars but sell their output domestically in peso-denominated prices that are slow to adjust. If so, shocks causing the exchange rate to depreciate will raise their financial liabilities relative to their revenues and damage their balance sheets. Or banks may lend in pesos while funding themselves in dollars. In this case, a negative shock to the exchange rate will damage bank balance sheets and threaten the solvency of the financial sector. Or banks with dollar liabilities may be more susceptible to runs insofar as peso deposits are more widely used for transactions (many foreign currency deposits are time deposits) and there are more questions about the ability of the lender of last resort to provide dollar liquidity. Or the government may borrow in dollars or dollar-linked securities while relying on peso-linked revenues. In this case, currency depreciation may be damaging to the sustainability of the public debt. Problems of public indebtedness may then spill over to the private economy, as happened in Argentina in 2001 and has happened more generally.⁸ All these are channels through which use of the dollar might increase the volatility of the IS curve by producing sharp changes in creditworthiness, output, and investment.

If financial liabilities are more heavily dollarized than assets (where the term "assets" is used broadly to denote investments producing expected revenue streams) and there are bankruptcy costs, dollarization may encourage fear of floating. The central bank will be reluctant to let the exchange rate depreciate for fear of worsening the financial condition of firms. It will use the interest rate to limit movements in the exchange rate. In contrast, if the asset side of the balance sheet is more

⁸ See Arteta and Hale (2005) for evidence on the impact of public debt problems on companies' access to external funding.

heavily dollarized (exports are quoted and settled in dollars but loans are denominated in pesos), dollarization will encourage interest rate smoothing. Fear that higher debt-servicing costs threaten bankruptcy may render the central bank reluctant to raise interest rates sharply in response to a shock, causing the exchange rate to depreciate.

In the limiting case, these balance sheet effects can limit the effectiveness of monetary policy as a stabilization tool. Cespedes (2003) and Chang and Velasco (2005) analyze these issues in a simple model. Their innovation is to model imperfect capital markets and the financial accelerator, à la Bernanke and Gertler (1989). Their analysis differs from the previous discussion by adding the distinction between stocks and flows: firms inherit a stock of debt D denominated partly in dollars and partly in pesos, and borrow abroad in dollars to finance current flows of investment. Because of asymmetric information, net worth matters for creditworthiness. The lower is net worth, the higher is the risk premium charged by lenders, and the more costly is investment. Net worth increases with output and sales (and hence with exports) but falls with the real value of debt. The authors distinguish financially robust economies, where the negative net worth effect of currency depreciation is dominated by the positive export-competitiveness effects, from financially fragile economies, where this relationship is reversed.⁹

In the financially robust economy, an exogenous decline in the world demand for exports causing the exchange rate to depreciate will have the standard positive effect on output and investment. Depreciation will at least partially offset the decline in export demand, since the improvement in export competitiveness still dominates the negative balance sheet effects.¹⁰

In contrast, currency depreciation will have further negative output effects in a financially fragile economy, where the negative balance sheet effects (resulting from the fact that currency depreciation renders dollar debts more burdensome) dominate the export competitiveness effects. In the first case, the central bank will prefer to let the exchange rate move in response to shocks; it will not manipulate the interest rate to stabilize the currency. In the second case, in contrast, the monetary

9 Output prices and costs are sticky and other assumptions are in the spirit of the standard open economy IS-LM model.

10 This will be the outcome in the limiting case where inherited debt or capital market imperfections—leading to large net worth effects—are absent.

authorities will rationally use the interest rate to limit exchange rate fluctuations, even in the face of shocks that cause output and investment to decline.¹¹

A number of time-series studies provide evidence that expansionary monetary policy leading to currency depreciation may be ineffective or even counterproductive for stabilizing output in economies with high levels of liability dollarization.¹² But the problem here, to repeat, is not use of the dollar per se but use of the dollar by firms that lack natural hedges (that is, firms in non-traded goods sectors) and excessive reliance on dollar liabilities that gives rise to destabilizing balance sheet effects.

Again, it is clear that the use of dollars for funding investment projects, for denominating exports, and for other transactions does not obviously undermine monetary control. The use of dollars, however, does have implications for the nuts and bolts of monetary policy implementation: for how actively the authorities respond to shocks and for the degree of exchange rate flexibility they prefer. In extreme cases where liability dollarization among domestic firms is widespread, there may also be limits on the effectiveness of monetary policy as a stabilization tool in the face of adverse external shocks.

In turn the fact that it may not be possible to use monetary policy actively to stabilize output when firms use international currencies to fund their investment projects has encouraged governments to consider measures to de-dollarize their economies and to develop markets financial instruments denominated in local currency. But policies to force de-dollarization and foster the development of financial markets in local currency instruments are two different things and may have very different welfare implications. The next section develops this point.

11 A variety of other analyses point to basically similar conclusions. Thus Caballero and Krishnamurthy (2004) develop a more elaborate model in which monetary policy is not effective as a stabilizing instrument in the face of foreign shocks when firms borrow abroad in dollars and hence domestic monetary policy cannot enhance international creditworthiness (that is, it cannot enhance the value of collateral).

12 For example, see Cespedes (2003) and Galindo, Panizza, and Schiantarelli (2003).

Encouraging the Use of Local Currencies

The previous section suggests a number of reasons why countries may wish to encourage use of their national currencies. Compared to a situation characterized by high levels of dollarization, the authorities may have more room for an autonomous monetary policy. Compared to a situation where the liabilities of firms, banks, and households are heavily dollarized, there will be more scope for stabilizing output by allowing countercyclical movements in the real exchange rate. Compared to a situation where currency mismatches are pervasive, there will be less financial fragility. The differential impact of domestic monetary tightening on firms with and without access to offshore funding will be less pronounced. The tendency for capital inflows to vary procyclically (because ability to repay will be more procyclical) will be less pronounced. The capacity of the central bank to act as a lender of last resort will be enhanced. And there are always the additional seigniorage revenues.

These observations have given rise to two parallel literatures on “carrots” and “sticks”: that is, on measures to foster the use of local currency in transactions of all sorts but in financial transactions in particular, and on measures to discourage use of the dollar.¹³ The latter include everything from outright bans on use of the dollar in local transactions to differential liquidity and capital requirements on banks with dollar deposits and regulations prohibiting the extension of dollar loans. A growing literature on de-dollarization assesses experience

13 The expression “carrots and sticks” in this context follows Levy Yeyati (2003).

with these measures, which have been utilized in a variety of countries starting with Bolivia in 1982.¹⁴ Advocates emphasize the very high costs of dollarization. While acknowledging that there may have been good reasons—stemming from the instability of domestic policy—for households, firms, and banks to adopt the dollar as unit of account, means of payment, and store of value, they observe that this situation of de facto dollarization, once it develops, has a tendency to persist. The decision of which currency to use is subject to network externalities. If some residents use dollars, it will then be more attractive for other residents to use dollars. Even if policy improves significantly, there may be a first-mover problem discouraging movement back to the domestic currency. These observations may then strengthen the argument for differential taxes and prudential measures, and even a statutory prohibition on using the dollar, to shock firms, banks, and households out of this suboptimal equilibrium.¹⁵

A more skeptical view is that residents have fled the domestic currency for good reasons and that in the absence of full policy credibility that can only be acquired over a long period they have equally good reasons for being reluctant to go back.¹⁶ Thus measures discouraging or prohibiting onshore use of the dollar, in financial and other transactions, will only encourage residents to accumulate dollar deposits offshore, precipitating capital flight. Banks unable to protect themselves against inflation by denominating their assets in dollars will shorten the maturity of their loans. Hence eliminating currency mismatches in this way will only

14 In 1982, the Bolivian authorities attempted to de-dollarize the economy by banning foreign currency deposits and converting dollar-denominated financial instruments into domestic currency claims at an exchange rate less favorable to creditors than that prevailing in the market. But with inflation continuing to rage, the main consequence was to encourage the growth of offshore deposits. Similarly, in Peru in 1985, the authorities converted dollar deposits into domestic currency deposits. The main effect in this case, given chronic inflation, was to discourage domestic financial intermediation.

15 The argument that dollarization is subject to “hysteresis” is developed in Guidotti and Rodriguez (1992). The subsequent literature includes a number of specific models of excessive dollarization as a suboptimal outcome; typically, these feature multiple equilibria. Broda and Levy Yeyati (2003) provide models in which dollar financing displaces peso financing because of the inability of creditors to share partial payments in bankruptcy. Although limited liability implies that, in default, partial payments are shared by different members of a creditor class (bondholders) according to a pre-specified rule, the correlation between default and surprise depreciation means that dollar debts increase in peso terms in states of default, causing creditors to prefer dollar debts in risky states of the world. And the prevalence of dollar debts then makes the world riskier. Ize and Powell (2003) provide a model in which high intermediation costs in pesos favor intermediation in dollars, based on the assumption that as the volume of intermediation in pesos goes down, intermediation in pesos goes up.

16 See for example Savastano (1996).

encourage the development of maturity mismatches. This approach is tantamount to treating the symptoms of currency and asset substitution rather than the underlying source of the problem. As such, suppressing one set of symptoms is likely only to give rise to another.¹⁷

The alternatives to negative measures making use of the dollar more difficult are positive steps to make the local currency more attractive. Here sound and stable monetary policies are widely regarded as necessary if not sufficient. Since it takes time to establish the credibility of policies, there may be an argument for the use of inflation indexation in financial instruments at least for a transitional period. The government can encourage this financial innovation by adding indexation clauses to its own bonds and using its regulatory authority to encourage banks to offer indexed deposits. This approach was pioneered by Chile and Israel in the 1980s and has been emulated by Latin American countries such as Bolivia, Brazil, and Uruguay with mixed success.¹⁸ The danger here is that indexation may heighten the sensitivity of the economy—and, in particular, the public finances—to shocks to confidence. Compared to the no-indexation benchmark (if not also to the initial situation where transactions are heavily dollarized), it may be easier for confidence crises to become self-fulfilling.¹⁹

17 The argument that nondiscriminatory policies are the efficient benchmark hinges on the absence of other distortions, as suggested by the theory of the second best. Authors like Broda and Levy Yeyati (2003) argue that other distortions are in fact pervasive. If other factors cause banks and others to underestimate the risks associated with dollar liabilities, then surtaxes and higher liquidity requirements on foreign currency deposits may be welfare improving. Another example concerns the differential moral hazard associated with deposit insurance. If deposit insurance is nondiscriminatory and currency-blind, it may have the effect of subsidizing foreign currency deposits more extensively than domestic currency deposits. In a world without deposit insurance, savers would presumably balance the benefits of foreign currency deposits (protection against inflation) against the costs (that banks are less likely to be able to make good on foreign currency obligations when there is a sharp devaluation). If dollar depositors are provided full protection against exchange risk in the worst states of nature courtesy of the deposit insurance agency (and, ultimately, at the expense of depositors in both currencies), then banks will not factor in the higher cost of dollar funding in bad states of the world, making dollar deposits artificially attractive.

18 In countries where the underlying pressure for inflation was not removed, the new indexed instruments appear to have lacked credibility. That is, pressure to resort to the inflation tax remained, creating an incentive to tamper with the indexation formula. Knowing this, investors were reluctant to take up the new indexed instruments. Thus Herera and Valdes (2003) argue that the substitution of indexed peso claims for dollar assets in Chile would not have occurred in a more inflationary environment.

19 A further technical issue is what to index to and how much standardization to require. A single index (to the CPI, for example) will maximize market liquidity, but multiple indices (based on, *inter alia*, sectoral output prices) may be more compatible with financial stability. Colombia is cited as a country where the emission of CPI-indexed claims created liquidity problems and fears of financial instability, leading the indexation formula to be changed repeatedly. Countries like Israel and Peru have eschewed CPI indexation, partly on these grounds.

A variety of other measures related to the development of market infrastructure have also been identified to foster the development of deep and liquid local currency financial markets and encourage residents to move out of the dollar. These include strengthening clearing and settlement systems, enhancing market transparency, improving corporate governance, installing efficient bankruptcy and insolvency procedures, and strengthening the rights of creditors holding claims in local currency. Other constructive measures identified in the literature include the creation of privately funded pension schemes mandated to pay contributors on a local currency schedule, which will encourage the emergence of a set of institutional investors with an appetite for long-term local currency claims. They also include regulatory measures to foster derivatives markets in which currency risk can be hedged. These goals are relatively uncontroversial, which is not the same as saying that they are easy to accomplish.²⁰

More controversial are the roles of fiscal and international economic policies. The literature includes conflicting results on whether government borrowing and private borrowing in the domestic currency are complements or substitutes. Those who argue for complementarity point to the importance of having a benchmark asset, typically a long-maturity government bond, off of which riskier credits can be priced. The government can therefore contribute to the development of a broader market by issuing an adequate stock of benchmark securities, whose existence is conducive to the development of market breadth, liquidity, and turnover. By issuing the entire range of maturities, it can promote the development of a well-defined yield curve. The counter-argument is that government borrowing crowds out private borrowing and that for this reason government bonds and private bonds are substitutes rather than complements.

One might seek to reconcile these views by arguing that government borrowing has positive market-making effects so long as it is limited to prudent levels, but that those effects may turn destructive if government borrowing is allowed to rise excessively. It also has been argued that governments can foster the development of benchmarks and yield curves without running significant deficits by over-funding their budgets: that is, by issuing more new debt than otherwise necessary, some

20 In addition, the absence of controversy does not extend to the particulars of these measures. For example, there is little agreement among either theorists or practitioners on the specifics of an efficient bankruptcy law, whose precise provisions differ quite extensively across countries.

of which is used to retire old issues with less liquidity or denominated in foreign currency (see McCauley 2003). In Asia, Singapore is an example of a country that has sought to consolidate scattered government agency securities into a unified set of benchmark issues. In Latin America, Brazil is an example of a country that has sought to exchange dollar-denominated debt for domestic-currency debt.

Another dilemma is how to sequence steps to foster local currency financial markets with liberalization of the capital account. Macroeconomists warn that governments should not proceed with capital account liberalization until they have first made progress in developing local bond markets. But market participants insist that countries cannot have local bond market development unless they first have open capital accounts. Lee Hsien Loong, Deputy Prime Minister of Singapore and head of that country's monetary authority, put the point well in an article in the Bank for International Settlements *Quarterly Review*:

“There is a trade-off between tightening up the capital account, and developing the bond markets. Measures to restrict offshore foreign currency trading have been effective, in so far as reducing or eliminating offshore markets is concerned. But these safeguards come at a cost—they also hinder the development of capital markets, especially bond markets. Size and liquidity are essential attributes for a market to attract international interest. Already in size and liquidity, we clearly lag behind our counterparts in the West. If Asian markets are fragmented and unable to grow, they risk being ignored by global investors.”²¹

Emerging markets would seem to be in a Catch-22 situation. Without removing capital controls, fostering the development of domestic bond markets will be an uphill fight. Yet relaxing remaining restrictions on the ability of residents and foreigners to invest across borders can heighten existing risks. It is widely recognized that these tradeoffs are implicit in efforts to build domestic bond markets by removing capital controls. What is less well understood is that even seemingly benign steps like harmonizing regulations and taxation, or creating a regional rating agency, or using central bank reserves to jumpstart private cross-

21 This quotation appears in Dwor-Frecaut (2003).

border investment, are the equivalent of capital account liberalization in the sense that they too would work to encourage cross-border capital flows. This is their intent, and it would certainly be their effect. And these measures create risks—as well as conflicting with the conventional wisdom regarding sequencing—insofar as they encourage capital mobility first and produce stronger markets only later.

Questions can also be raised about the role of the exchange rate. A number of studies, summarized in de la Torre and Schmukler (2004), suggest that countries with pegged exchange rates rely more on foreign currency funding. An interpretation, following Goldstein and Turner (2004), is that a low observed level of exchange rate variability causes banks and firms to underestimate the risks of dollar borrowing to domestic stability. Only if they see the exchange rate fluctuate on a day-to-day basis will borrowers properly take these risks into account. This suggests that one constructive measure that the authorities can use to encourage use of the local currency is to move to a more flexible rate. The problem, of course, is that greater exchange rate flexibility may be corrosive to financial stability so long as liabilities remain heavily dollarized. Once more there may be a Catch-22 situation. As long as funding is heavily denominated in foreign currency, the central bank may have good reason to resist greater exchange rate flexibility; but as long as it resists greater exchange rate flexibility, funding will be heavily denominated in foreign currency.

Implications for Monetary Policy in the United States and Other Issuing Countries

It is sometimes asserted that widespread use of the dollar, euro, and other currencies internationally should influence the formulation of monetary policy by the Federal Reserve and the European Central Bank. Just as I argue above that the existence of international currencies has limited implications for the conduct of monetary policy in emerging markets, I argue here that it should have limited implications for the formulation of monetary policy by the Federal Reserve, the ECB, and other issuing central banks.

Whenever monetary policy in one country is a source of externalities felt by other countries, there is a case for internalizing these effects. If monetary tightening in the United States has an impact on economic and financial conditions in emerging markets, then there may be an efficiency argument for the Federal Reserve (and other issuers of international currencies) to take these effects into account. To the extent that doing so forces the Federal Reserve Board to move away from the policy setting that is optimal from a narrowly U.S. point of view, other countries can in principle compensate the United States by adjusting their monetary and other policies in directions that benefit the United States.

However, there is an important distinction between pecuniary and nonpecuniary externalities. If monetary policy in the center simply affects prices in the periphery, then it will be straightforward for other central banks to take offsetting action. If tightening by the Federal Reserve Board causes the dollar to strengthen and exchange rates in the periphery to weaken, fanning inflation there, central banks

in the periphery can simply tighten in response: end of story. But if the externalities are nonpecuniary, then the case for internalization is stronger. If central banks elsewhere are incapable of completely offsetting the impact of Fed policy on their economies, or if doing so has undesirable side effects—as will be the case when there are nominal rigidities (damping down inflation will also cause output losses)—then there may be an argument for the Fed to take these effects into account when formulating monetary policy. This argument will be even stronger when foreign central banks are fully incapable of offsetting the effects of foreign shocks, as in the special cases analyzed by Cespedes (2003) and Chang and Velasco (2005) (referenced above). If Federal Reserve action or inaction has implications for financial stability in emerging markets and hence for the stability of the global financial system, again there will be an argument for taking these implications into consideration. This was arguably the motivation for the Federal Reserve to loosen as aggressively as it did in the wake of Russia's default and the all-but-failure of Long-Term Capital Management in 1998: that it was conscious of the implications of these events not just for the U.S. economic and financial system but for the global economic and financial system as well.

Even where these potential benefits of adjusting monetary policy with conditions in other countries in mind exist, they should be balanced against the costs. Central bank policy is most credible and effective when it is simple, straightforward, and easy to communicate. The case that a particular policy adjustment is consistent with the central bank's core mandate to maintain price stability will be harder to make when the rationale for that adjustment is based on spillovers to other economies and feedbacks to the initiating country. This, together with the fact that this rationale must be based on the distinction between pecuniary and nonpecuniary externalities, suggests that modifications in Federal Reserve and ECB policy based on this rationale should be the exception rather than the rule. Again, a distinction is usefully drawn between exceptional circumstances like the Russia-LTCM crisis of 1998 and the fact that a substantial fraction of dollar currency circulates outside the United States, something that has been the case for many years but does not create the basis for more than a minor modification of Federal Reserve policy.

Once more it would seem that these arguments are weaker in the special case where the entity using the international currency for domestic transactions is an internationally active corporation. The implications for

financial stability of sharp changes in asset prices will be less. Thus the capacity of central banks in other countries to offset the impact of induced changes in Federal Reserve policy will be correspondingly greater. The phenomenon identified by the Conference Board survey—that multinational corporations use international currencies for their transactions in third markets—does not create a prima facie case for modifications in Federal Reserve operating strategies.

Conclusion

The recent survey of the Conference Board documents the widespread use of the dollar and other international currencies in transactions by multinational corporations outside the issuing countries. This phenomenon is best thought of as a particular instance of the more general phenomenon of de facto dollarization. Viewing the practice in this light leads almost immediately to the conclusion that the phenomenon has relatively limited implications for the conduct of monetary policy. To the extent that some share of economic activity is rendered responsive to U.S. rather than local interest rates, those local rates may then have to be adjusted more aggressively in response to shocks with implications for inflationary pressure. To the extent that there are heightened risks to financial stability, the national central bank will have to take these into consideration. But the general case is one where the result will be only limited adjustments in the stance of domestic central bank policy. Only in the extreme case in which levels of de facto dollarization are very high may the ability of monetary policy to stabilize output be vitiated and may financial stability be placed at risk. Similarly, the fact that dollars are widely used outside the United States, by multinational corporations and others, creates the case for modifications in Federal Reserve policy only under exceptional circumstances, not on a day-to-day basis.

These, in any case, are the conclusions suggested by economic theory and by cross-comparisons of the correlation between de facto dollarization and price and output stability. The Conference Board and Group of 30 might usefully supplement this indirect reasoning with direct

evidence. In addition to surveying multinational corporations on their use of the dollar, they might survey central banks on how de facto dollarization influences their conduct of monetary policy. The most convincing evidence on this question would come from the horse's mouth.

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