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# **Up From Sin: A Portfolio Approach to Financial Salvation**

**Randall Dodd and Shari Spiegel**

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## PREFACE

The *G-24 Discussion Paper Series* is a collection of research papers prepared under the UNCTAD Project of Technical Support to the Intergovernmental Group of Twenty-Four on International Monetary Affairs (G-24). The G-24 was established in 1971 with a view to increasing the analytical capacity and the negotiating strength of the developing countries in discussions and negotiations in the international financial institutions. The G-24 is the only formal developing-country grouping within the IMF and the World Bank. Its meetings are open to all developing countries.

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# **UP FROM SIN: A PORTFOLIO APPROACH TO FINANCIAL SALVATION**

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## *Abstract*

*In this paper, we develop a proposal with the potential to greatly improve the ability of developing countries to reduce their exposure to other countries' interest rate and exchange rate volatility and to lower their cost of raising capital abroad. The key to achieving these goals is for developing countries to borrow in their own currencies and for investors to lend by creating portfolios of local-currency government debt securities that employ the risk management technique of diversification to generate a return-to-risk that competes favourably with other major capital market security indices. We show, based on data from the early 1990s, that a portfolio of emerging market local currency debt can generate rates of return relative to risk that compete with those of major securities indices in international capital markets. It bears noting that the early 1990s witnessed several severe shocks to international capital markets, including the crises in East Asia, the Russian Federation and Brazil, and the failure of Long-Term Capital Management. We also analyse the implications of deploying such a policy for attracting capital to developing countries, the impact on the stability of their financial systems and on their costs of borrowing, and the implications for future development of local capital markets.*



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# UP FROM SIN: A PORTFOLIO APPROACH TO FINANCIAL SALVATION

**Randall Dodd and Shari Spiegel\***

## Introduction

The massive amount of foreign indebtedness is one of the most significant problems facing developing countries today. The majority of this debt is denominated in the major currencies,<sup>1</sup> and it has left developing countries with enormous exposures to foreign exchange and foreign interest rate risk. External shocks transmitted through these exposures have proven costly to absorb. Most of the emerging market crises over the past two decades were caused, or at least exacerbated, by foreign borrowings (although derivatives have added substantially to foreign-currency-denominated liabilities in some cases<sup>2</sup>). Concerns over foreign debt were raised soon after the 1973 oil price shock, and the problem became apparent in the early 1980s after Mexico announced it would be unable to meet its debt payments in August of 1982. More recently, outstanding dollar linked bonds were one of the main triggers of the 1994 Mexican crisis; dollar denominated private debt was one of the factors in the 1997 Asian crisis; and

Argentina's large issues of external debt was a primary factor in its 2001 default.

Most of the economic policy research since the developing country debt crisis broke out in 1982 has focused on solving the problem of foreign investors managing their credit risk exposure and the problem of developing countries adjusting to the variability of foreign capital flows and financial crises. Less attention was given to strategies to help developing countries reduce their foreign exchange exposure. More recently, the issue of foreign exchange risk arising from foreign indebtedness has received greater as a result of a new body of economic policy research around the "original sin" hypothesis of Eichengreen and Hausmann (1999). There is now some new thinking about the challenge faced by developing countries in moving away from foreign-currency-denominated borrowing.

In this paper, we take up that challenge by building on the early experiments<sup>3</sup> and providing a policy

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analysis of what we hope will prove to be a major new financial innovation to financing development. It improves market efficiency by overcoming some existing market imperfections. It requires negligible statutory or regulatory changes. And it does not necessarily require the involvement of such international financial institutions as the IMF or World Bank, although it may well benefit from some official or public sector sponsorship.

Our proposal is to raise capital in international markets by forming diversified portfolios of emerging market local currency debt (LCD) issued by sovereign governments. We show that the returns on such a portfolio are sufficiently independent to allow a substantial reduction in portfolio variance through diversification, to produce a risk-return profile – measured in dollars – that is competitive with major United States and European security indices.

In the following section we will discuss the context of this problem and the economic literature that addresses it. Following that, we develop the financial economic basis for the LCD portfolio and analyse its financial performance relative to some familiar alternative investments. We then analyse the development and economics implications of this new financing facility for developing economies and offer concluding comments.

## Overview of the issue

One key difference between advanced and developing economies<sup>4</sup> is that the latter generally cannot borrow in international capital markets in their own currency.<sup>5</sup> While other distinguishing features include the capital-labour ratio, productivity, education levels, and sophisticated financial systems, the inability of developing countries to borrow internationally in their own local currency is a critical element affecting their financial stability.

Many developing countries need capital inflows to augment domestic savings so as to obtain a pace of investment consistent with rapidly rising growth. In addition to foreign direct investment, developing countries need capital investment in the form of credit. If they are unable to negotiate terms denominated in their own local currency, then they must enter into a Faustian compact in which the joys of

lower interest rates are held captive by the obligation to repay in foreign currency denominations.

## Market description: foreign currency claims

While foreign debt can play a useful economic role in development by supplementing domestic savings, its currency denomination can create unwanted exposure to exchange rate risk. Consider the breakdown of developing country long-term external debt. The latest year for which data are available on currency composition is 2000 (from the World Bank's Global Development Finance database). The total long-term external debt that year was \$2,047.7 billion (it would rise to \$2,644 billion through the end of 2003). Of that, 64 per cent was denominated in dollars, 12 per cent in yen, and 9.5 per cent is in Deutsche mark, French francs and pound sterling. The six currencies comprise at least 85.5 per cent of the long-term indebtedness of developing countries; another 7.6 per cent was debt in "multiple currencies" (these six currency likely make up a large share of this figure) and 7.2 per cent in all other currencies.<sup>6</sup>

Two particular examples, drawn from Mexico and the Republic of Korea just prior to their financial crises, illustrate the predominance of major currencies, and the lack of their own local currencies, in denominating their foreign debts. In December of 1994, 61 per cent of Mexico's long-term foreign debt was denominated in dollars, 21 per cent in "multiple currency" formulas, and 9 per cent in yen. Measured at year-end 1996 – the last data point prior to the financial crisis – the dollar composition of long-term debt of the Republic of Korea was 79 per cent, while that in yen and multiple currencies stood at 13 per cent and 5 per cent respectively. Thus, 92 per cent of the foreign debt of the Republic of Korea was in two major currencies: the dollar and the yen.

## Consequences of foreign currency borrowing

The consequences of foreign currency denominated indebtedness are a major source of developing country's exposure to international disruptions and disturbances, as well as their vulnerability to domestic fiscal solvencies and exchange rate systems. This

the more fragile economies of developing countries subject to monetary policy changes in the country (or countries) whose currency denominates their international debt. If foreign central banks tighten monetary policy and raise interest rates, this will increase foreign currency interest payments for the developing countries on both variable rate debt and new issuances while they will also see the market value of their foreign currency assets reduced. For example, in the 10 months prior to the financial crisis in Mexico in December 1994, the Federal Reserve raised short-term interest rates six times, from 3 per cent to 5.5 per cent and the dollar rose by more than 7 per cent against other Group of Ten (G-10) currencies. This put enormous external pressure, on the peso while diminishing the Mexican central bank's capacity to defend it. Similarly, it was the rapid rise in United States interest rates in response to the oil price hike in the late 1970s that precipitated the Latin American debt crises of the 1980s.<sup>7</sup>

An appreciation in the value of the foreign currency of denomination would also raise the cost of servicing foreign debt and put pressure on the international value of the local currency. In the months preceding the first East Asian crisis, the dollar appreciated substantially against the Japanese yen. Starting in August 1996, the dollar rose 8.2 per cent by January 1997; it was up 19 per cent by May 1997 when the Thai baht was hit by speculative attacks; by December 1997, the dollar had risen 25.5 per cent over the previous 14 months. This had the effect of substantially raising the value of Thailand's dollar denominated debt, and in comparison, lowering the value of their yen-denominated exports.

The accumulation of international debt denominated in foreign currency poses a danger to more fragile financial systems, which often have dollar-denominated liabilities and local currency assets. Borrowing in foreign currency causes a "currency mismatch" that exposes the developing country to devaluation or some other international disruptions; and borrowing short-term causes "maturity mismatch" that exposes the country to other volatile economic sources that contribute to creating a fragile financial system. It creates a economic precipice by dramatically raising the cost of devaluation, and it makes policymakers more reluctant to let the currency devalue even when it becomes overvalued.<sup>8</sup>

Foreign-currency borrowing also reduces a country's ability to pursue independent monetary and

fiscal policy. The country's monetary policy is constrained through its impact on exchange rates and, in turn, its impact on the local currency cost of servicing foreign debt. Thus, a central bank that would otherwise respond to a contractionary shock by easing credit conditions would be hampered from doing so for fear of the reducing its currency value and thereby raising the cost of servicing its foreign debt.

Foreign-currency borrowing also undermines the credibility of central banks in developing countries because their foreign reserves, which might amount to a significant proportion of their imports and trade balances, can be dwarfed by the country's foreign-currency debt obligations. Foreign-currency indebtedness therefore necessitates increased holdings of foreign reserve, which can be quite expensive.<sup>9</sup>

The ability to engage in fiscal policy of foreign-currency borrowers is also affected. It is constrained because any increase in the fiscal deficit will widen the country's credit spread and further push up the cost of borrowing. High foreign indebtedness forces countries to follow pro-cyclical macroeconomic policies, raising interest rates and tightening fiscal policy during a recession.<sup>10</sup> Foreign-currency borrowing also undermines the fiscal credibility of developing countries because so much of their sovereign debt is known to be denominated in foreign currency.

On the other hand, borrowing in local currency adds to the tax base for seigniorage revenue in the home country owing to the increase in demand for the local currency for the purpose of trading in the local currency instrument, as well as in the process of making and receiving payments on those securities.

Yet an additional benefit is that the development and growth in the market for the local currency government securities plays a critical role – as a foundation or skeletal structure – in promoting more "mature" domestic securities markets.

The danger from amassing foreign currency debt is so great that it calls into doubt the efficiency of international capital markets in distributing risk. Why is the foreign exchange risk so disproportionately held by those least able to bear it? If this distribution of risk signals a market imperfection, then it highlights the need for an innovation or new public policy to rectify it.

### *Recognition of a problem*

The recognition of the problem of borrowing in foreign currency is not new. Soon after developing countries' indebtedness began to rise rapidly following the 1973 oil price hike, and well before Mexico's payment crisis erupted in August 1982, there were public policy discussions of this concern. One notable contribution to the debate came from Gerald Pollack (1974), an Exxon Corporation executive writing in *Foreign Affairs*, who offered an early warning of the consequences of large, dollar-denominated borrowing by developing countries. He stated, "the Eurocurrency market has several defects for present purposes" and particularly "the Eurocurrency market is not well suited to resource-poor or politically unstable developing countries with low credit standing." He warned, "[t]his question of financial instability may turn out to be the biggest of the threats posed by the energy crisis."

Commenting upon the build-up of large foreign debts after the first and second oil price hike, Walter J. Levy (1980) stated, "The debt problem could, of course, be solved if the values of the currencies in which the debts are incurred decline ... [which] in fact did occur between 1974 and 1978 ... But it seems now that the jig is up."

Writing just prior to the 1982 payments crisis, Bacha and Diaz-Alejandro (1982) expressed concerns about prospective borrowing conditions in the 1980s that were "moderately pessimistic relative to repeating the favourable performance of the 1970s." With regard to dollar-denominated debt, they stated, "A major uncertainty for LDC borrowers looking at the 1980s is whether the low or even negative real rates of interest prevailing during the 1970s will return." In particular they cited the risk of tightening monetary policy in the United States as a factor leading to higher interest rates and a higher dollar.

Much of the academic economics literature is focused on the issue of the credit risk faced by the international banks acting as intermediaries in this recycling process. Two noteworthy contributions came from Laurie Goodman (1980 and 1981). In a 1980 study for the New York Federal Reserve Bank, she provided an exemplary descriptive analysis of the financial instruments used for recycling petrodollars, and she then analysed the pricing of these syndicated, dollar-denominated, variable-rate bank loans. The principal concern at the time was whether

the loans, which were priced as a spread above LIBOR, generated sufficient returns to banks' portfolios in proportion to their credit risk for the banks.

In a follow-up study, Goodman (1981) analysed the possible problems of credit risk from the point of view of lenders. She empirically tested a model of diversification to show that banks could gain by diversifying their credit risks across countries. Although only limited data were available at that time, Goodman showed that the country risks associated with lending to various developing countries were more different than similar – that is, the *unique* risk is greater than the *common* or *systematic* risk. Since it is the unique risk that can be reduced through diversification, Goodman suggested that international banks could successfully manage the risk on their loans to developing countries through diversification.

One of the first articles in the economics literature to discuss the market risk associated with foreign-currency borrowing (as opposed to credit risk) in the context of international lending to developing countries was written by Lessard (1983). Writing in the wake of Mexico's debt crisis in August of 1982, Lessard pointed out that the form of debt issued to developing countries was "unsound", and that criticism had been too focused on the quantity of foreign borrowing and not sufficient attention was being paid to the fact that "[foreign lending] is structurally unsound and is likely to result in misjudgments and misbehaviour on the part of lenders and borrowers." He went on to clarify what he meant by structurally unsound, stating that "a financial system that relies overwhelmingly on bank credit is unlikely to be an ideal system in terms of world welfare ... it involves debt service patterns that vary perversely with LDCs' net foreign exchange earnings ... [and] it shifts risks from LDCs to world capital markets only through default [i.e., bankruptcy]."

While drawing needed attention to key features of foreign debt, such as the problems caused by their variable interest rate structure, Lessard failed to strictly identify foreign exchange risk as a major source of the "perverse variability of debt service obligations". Perhaps he took for granted that foreign debt would be denominated in foreign currency. Lessard did, however, foresee the more recent trend in development finance research, discussed below, by recommending that debt service be stabilized through the use of price level index-linked loans.



### *Contemporary insights into foreign exchange risk*

Whereas the problems associated with developing countries' exposure to foreign exchange risk have been recognized by some people for quite awhile, they have attracted greater attention in recent years. This can be attributed to the research and provocative title – the “original sin” hypothesis<sup>11</sup> – developed by Hausmann, Eichengreen and others. Their work in Hausmann et al. (2001 and 2002) and Eichengreen et al. (2002 and 2003) has made a significant contribution to the study of development economics and sparked a much needed debate on exposure to foreign exchange risk. It has also contributed to the policies designed to raise living standards in the developing world by focusing attention squarely on the risks associated with the investment vehicles that conducted capital to developing countries. (A summary of their Emerging Market Index, as well as a discussion of its shortcomings, are included below in appendix A.)

Simply put, Hausmann and his colleagues argue that the principal problem facing development finance is that developing countries cannot borrow in their own currency. Instead they have borrowed in “hard” currencies such as the dollar, euro (and its predecessors), sterling, and yen and this has exposed them to foreign exchange rate fluctuations not entirely within their control.<sup>12</sup> Had these countries been able to borrow in their own currency, Hausmann et al. conclude, they would have been better able to handle shocks and other policy errors.

Dodd (2001) identifies currency mismatches as a major source of vulnerability affecting financial sector stability in developing countries and analyzes the role of derivatives in increasing the magnitude of the mismatch. Developing country financial institutions were able to resort to derivatives, often unregulated or under-regulated as off-balance sheet items, to achieve greater leverage and circumvent restrictions on their balance sheet's currency mismatches. The result was that they did not hedge their long dollar and short local currency mismatch, but rather took larger short dollar positions in order to capture the gains from the substantial interest rate differential between the dollar and their local currency. Dodd pointed out the difficulty for governments, as well as private sector investors, in monitoring the volume of open interest and trading volume in a

market that has no regulation to require reporting and disclosure.

Expanding on a problem they identified in 1996,<sup>13</sup> Goldstein and Tucker (2004) provide a comprehensive policy analysis that addresses the issue of currency risk head on, that is, the exposure to foreign-currency mismatches leaves developing countries vulnerable to financial shocks, deepens the impact from the shock, and hampers the use of monetary policy in preventing a contraction or crisis. The Goldstein and Tucker thesis – although largely distracted by its authors' effort to refute the “original sin” hypothesis that bad things happen to good countries – does provide a useful explanation for why currency mismatches are important and how to best measure them. Unfortunately the book's policy recommendations are little different from the advice offered before these insights were established. Instead of trying to address the problem directly, the authors advocate inflation targeting, floating instead of fixed exchange rates regimes, and fiscal rectitude in government budgets.

Allen et al. (2002), of the IMF's Policy Development and Review Department provides an authoritative and comprehensive analysis of the balance sheet aspects of developing country financial crises. They identify the major types of risk that characterize a nation's balance sheet vulnerability and site foreign currency mismatch as a major factor, saying that “Almost all recent crisis episodes were marked by currency mismatch exposures.” One of their key conclusions is that “The currency and maturity structure of the outstanding debt stock is almost as important as the total size of the debt stock.” Another is that “A currency mismatch anywhere in the economy constrains the government's capacity to act as a lender of last resort in domestic currency.”

The policy recommendations of Allen et al. include the need to develop local currency equity and debt (especially long-term debt) markets in order to raise capital while limiting financial vulnerability. This includes developing derivatives markets – although they recommend that “attention must be paid to the risks incurred by those who are supplying the hedging instruments” (Allen, 2002). Allen et al. also cite the need to hold larger foreign reserves and the need for great external official lending (i.e., IMF, World Bank, and bilateral lending).

However, as discussed earlier, holding foreign reserves can be expensive for developing countries.

Furthermore, additional external borrowing in foreign currencies – whether it be by the IMF, World Bank, or the private sector – will only to exacerbate the problem of currency mismatch associated with external debt. The international financial institutions need to look instead towards the more radical approach of lending in local currencies. In the following sections of this paper we will analyse this possibility in more detail, and show why lending in local currencies is *not* a high risk strategy for foreign creditors.

### Salvation through diversification: a policy remedy

We believe that there is a better way to finance development. In this section, we develop a policy remedy that is both economically more efficient and, if politics is truly “the art of the possible”, more politically feasible. One important testament to its viability is that, as described below, it has already been successfully pursued by at least one major asset manager.

We will call this approach the “emerging market local currency debt portfolio” (or LCD). The original idea for this portfolio-based approach draws heavily on the work of Shari Spiegel, based on her experience in creating and managing a diversified, local currency developing country debt portfolio for Lazard Freres (from May 1995 to January 2003).<sup>14</sup> The fund was operated with the goal of capturing high rates of return paid on local currency securities while reducing risk through diversification.

The LCD proposal does not require that international financial institutions such as the IMF or World Bank play a pivotal role in its success. These official financial institutions could, however, make highly productive contributions (see below).

Although the LCD policy is low cost and feasible, its potential benefits are substantial. It offers direct help to countries to enable them to borrow in their own currencies – both at home and abroad – in what could become a seamless market. The gains from this alone are potentially enormous. Developing economies will benefit also from greater stability as a result of their reduced exposure to changes in foreign exchange rates and interest rates, which are all the greater because of their correlation, in the

dollar and other major currencies. They will also gain from increased seigniorage and from potentially lower costs of borrowing in their local currency.

Staying with the theme of Christian theology inspired by Hausmann’s work, the LCD portfolio will lead to – if not outright redemption of “original sin” – absolution of worldly sins so as to facilitate progressive steps toward financial salvation.

### *The portfolio approach*

The core idea of the LCD approach is to apply the insights of portfolio theory,<sup>15</sup> part of the discipline of financial economics – toward enabling developing countries to borrow in their own currencies. The insight offered by portfolio theory is that a portfolio consisting of different securities whose returns are sufficiently independent (and especially so if they are negatively correlated) can yield superior risk-adjusted rates of returns than the individual securities. In other words, the volatility of the whole is less than that of the sum of its parts.

The LCD portfolio would work by buying local currency government debt<sup>16</sup> instruments from many different developing countries and combining them so as to produce a portfolio whose return and variance would be competitive in international capital markets. The market risk, which consists of the uncertainty of domestic interest rates (i.e., interest rates in local currency assets) and exchange rates of each local currency security, is often significant. From 1994 to 2003, the average volatility of individual country returns on local currency debt instruments was nearly 16 per cent.<sup>17</sup> At the same time, yields on local currency debt were also high, at 13.7 per cent on average, but not high enough to compensate for the risk. Hence investing in any one local currency market was not attractive.

Combining the returns on individual country securities into a portfolio, however, does produce desirable results. As we will show below, returns on a diversified portfolio range from 8–10 per cent annually while the risk of a diversified portfolio drops substantially to approximately 5.5 per cent (which is in line with United States investment grade bonds).

Note that this approach does not involve hedging the currency risk. It is very expensive to reduce

this market risk by hedging with derivatives because the cost of hedging is equivalent to the differential between foreign and local interest rates and, as discussed above, local interest rates tend to be very high. Another reason why hedging costs may be expensive is that there are a disproportionate amount of short-hedgers in the market and a relative shortage of speculators willing to speculate on long-positions in local currencies.<sup>18</sup>

In other words, the costs of the hedge overwhelm the benefit of cross-border borrowing or investing. In this context, the most cost-effective method for mitigating risk exposure is achieved through diversification across different countries' local currency debt. It is the *unique* aspect of this risk that can be substantially reduced through diversification. The reason for this is that, historically, currency devaluations have had extremely low correlations.

We began our analysis by examining the exchange rates of 46 developing countries, (leaving out Latvia from above). The countries were selected primarily on the basis of the availability monthly data since 1980; we then eliminated some countries that had extraordinarily stable exchange rates such as Saudi Arabia and Oman and we dropped Zimbabwe for the opposite reason. The annual rate of change in all of these countries' exchange rates between January 1995 and March 2004 was 9.8 per cent; and of the 37 countries that had data going back to January 1990, the average rate of change was 10.2 per cent over the longer 14-year period (with highs reaching -78.4 per cent and -43 per cent annually for Brazil and Romania respectively).

We then analysed the monthly rates of change for 47 developing country currencies from January 1980 to March 2004. The average correlation between the rates of change for those 47 countries during that time period was 0.0713 – in other words, not a high degree of correlation on average. The average correlation coefficients for the individual countries are listed in table 1.

Diversification is also a means of reducing credit risk. For most local currency securities, however, credit risk is not the primary risk. Most developing countries are more highly rated for debt obligations in their own currencies than in foreign currencies. Table 2 shows several recent examples – Brazil is the only exception – of how local currency

Table 1

**AVERAGE CORRELATION COEFFICIENTS  
FOR 47 DEVELOPING ECONOMY  
EXCHANGE RATES, 1980–2004**

Argentina	0.013
Bangladesh	0.040
Botswana	0.123
Brazil	0.059
Bulgaria	0.025
Chile	0.033
Colombia	0.040
Côte d'Ivoire	0.087
Croatia	0.150
Czech Republic	0.180
Ecuador	0.022
Egypt	-0.012
Estonia	0.217
Ghana	0.042
Hungary	0.153
India	0.063
Indonesia	0.038
Israel	0.085
Jamaica	0.027
Jordan	0.097
Kenya	0.077
Latvia	0.078
Lebanon	0.003
Lithuania	0.060
Malaysia	0.073
Mauritius	0.144
Mexico	-0.020
Morocco	0.190
Namibia	0.109
Nigeria	0.022
Pakistan	0.061
Peru	0.042
Philippines	0.045
Poland	0.082
Republic of Korea	0.028
Romania	0.041
Russian Federation	0.021
Slovakia	0.205
Slovenia	0.206
South Africa	0.110
Sri Lanka	-0.017
Thailand	0.086
Trinidad and Tobago	0.008
Tunisia	0.169
Turkey	0.054
Ukraine	0.006
Venezuela	-0.014

**Data:** IMF, *International Financial Statistics*.

credit ratings are usually two notches above that on foreign currency debts. With the exception of the Russian Federation, default on local-currency government debt has been extremely rare. The primary risk to investing in local-currency government debt is the domestic market risk (interest rate and exchange rate uncertainty).

From an investor's perspective, credit risk is the primary risk on external debt, such as long-term Eurobonds, issued by developing countries. Consider the comparison of credit risk on dollar-denominated securities versus market risk on local currency denominated securities. These are captured by the average correlation coefficients for the Emerging Local Markets Index (ELMI)+ and the Emerging Markets Bond Index (EMBI)+, calculated by JP Morgan. The ELMI+ index measures the rates of return (change in price plus interest payments) on local-currency debt securities in each of the 25 listed countries. The EMBI+ index measures the rate of return on United States dollar denominated debt securities in the 20 countries listed. There are 13 countries for which there are both ELMI+ and EMBI+ data.<sup>19</sup>

The correlation coefficients are presented in table 3. Some of the correlation coefficients have

**Table 2**

<b>DEBT RATINGS: LONG-TERM MATURITIES</b>		
	<i>Foreign currency</i>	<i>Local currency</i>
Brazil	B+	B+
Chile	A-	A+
Colombia	BB	BBB-
Costa Rica	BB	BB+
Egypt	BB+	BBB
Estonia	A-	A+
Malaysia	BBB+	A
Mexico	BBB-	BBB
Mozambique	B	B+
Peru	BB-	BB+
Philippines	BB	BB+
Poland	BBB+	A+
Republic of Korea	A	AA-
South Africa	BBB	A-
Thailand	BBB	A-

**Data:** Fitch Ratings, February 2004.

**Table 3**

**AVERAGE CORRELATION COEFFICIENTS  
FOR ELMI+/EMBI+**

(May 1993–May 2004, monthly)

	<i>ELMI+</i>	<i>EMBI+</i>	<i>Difference</i>
Argentina	-0.011	0.396	0.407
Brazil	0.115	0.495	0.380
Bulgaria		0.469	
Chile	0.165		
China	0.129		
Colombia	0.059	0.419	0.360
Czech Republic	0.103		
Ecuador		0.454	
Egypt	0.044	0.487	0.444
Hong Kong, China	0.110		
Hungary	0.092		
India	0.170		
Indonesia	0.131		
Israel	0.002		
Malaysia	0.151	0.390	0.239
Mexico	0.135	0.553	0.418
Morocco		0.533	
Nigeria		0.525	
Panama		0.539	
Peru		0.533	
Philippines	0.133	0.466	0.333
Poland	0.174	0.514	0.339
Republic of Korea	0.159	0.405	0.246
Russian Federation	0.202	0.431	0.228
Singapore	0.187		
Slovakia	0.078		
South Africa	0.065	0.126	0.061
Taiwan Prov. of China	0.186		
Thailand	0.230		
Turkey	0.074	0.334	0.260
Ukraine		0.360	
Venezuela	0.121	0.465	0.344
<i>Average</i>	<i>0.120</i>	<i>0.445</i>	<i>0.312</i>

**Note:** ELMI+ adjusted for euro/dollar rates for Central Europe.

high *p-values* which suggests that there are some periods of time in which the correlations are higher (as well as lower) than the coefficients would indicate.

The correlation coefficients under the column ELMI+ measure the average correlation between the country (in the column to the immediate left) and the other 24 countries for which there are data (empty

rows indicate there are no data for that country in either ELMI+ or EMBI+). The average correlation is pretty low and is negative for Argentina.

The coefficients under the EMBI+ column are the same measures but for dollar denominated foreign debt. Note that they are, on average, substantially higher than for local currency debt securities. For the 13 countries for which there are common data the average correlation coefficient is 0.312 higher for the credit risk reflected in the EMBI+ than for market risk reflected in the ELMI+ series.

The financial economic lesson to be drawn from this comparison is that the potential reductions in market risk through diversification are greater than the potential reductions in credit risk.

### *Principles of financial economics applied to constructing an LCD portfolio*

Given these properties of exchange rates and market returns, a portfolio of local currency debt securities can be constructed so as to provide foreign investors with an attractive investment vehicle.

Four interrelated decisions must be made in choosing the securities to be included in the portfolio: the number ( $n$ ) of securities; which countries to include among the  $n$  in the portfolio; which securities in each country to include; and the weight of each security in the portfolio.

The decision to choose certain securities for inclusion in the portfolio will depend upon their returns, the distribution of those returns, and the correlation with other securities in the portfolio. If the distributions of returns on the  $n$  securities have sufficient independence, then their combined yield and variance will produce a portfolio return and variance that compete with benchmark fixed income portfolios from the advanced capital markets in the major currency economies – e.g., United States corporate bonds – and have substantially less volatility than such equity indices as the Standard and Poor's (S&P) 500, DAX, the Financial Times Stock Exchange (FTSE) 100, and the Nikkei 225 stock indexes.

An expression for the country returns – comprised of changes in the exchange rate, interest

payments, and the change in price of the local debt instrument – can be derived from the following equation for interest rate parity, where  $r$  is the dollar or major currency rate of return (coupon payments plus change in market price),  $r^*$  is the local current rate of return, and  $e$  is the exchange rate in consecutive periods.<sup>20</sup>

$$1 + r = [(1 + r^*) e_t / e_{t-1}] \quad (1)$$

Equation (2) represents the portfolio rate of return ( $r_p$ ) from period  $t$  to period  $t+1$  from investing in  $n$  countries' local currency securities, where each country is weighted by a factor  $x$  in the portfolio.

$$r_p = \sum_{i=1}^n x_i (1 + r_i^*) e_t / e_{t-1} - 1 \quad (2)$$

The role of diversification in forming the portfolio is critical. The LCD portfolio would consist of a sufficient number of different securities from different countries so as to reach acceptable levels of market and credit risk.

The variance of the portfolio ( $\sigma_p$ ) is determined according to the following equation (3), where  $x$  corresponds to the weights of the securities in the portfolio,  $\rho$  is the correlation coefficient,  $\sigma$  is the standard deviation, the subscript  $p$  denotes portfolio, and the securities in the portfolio are represented by  $i$  and  $j$ .

$$\sigma_p^2 = \sum_{i=1}^n \sum_{j=1}^n x_i x_j \sigma_i \sigma_j \rho_{ij} \quad (3)$$

The main idea is to combine securities with different distributions so that the variance of the combination is potentially less than that of each of the individual securities. If the securities have a negative correlation, then the variance of the combination – that is, the portfolio – can be very small. If they are not negatively correlated but nonetheless have low correlations, then the portfolio variance can still be greatly reduced, so that the variance of the whole is less than that of the sum of the parts.

Up to now, we have assumed that market risk includes both interest rate and currency risk. The two can, however, be unbundled and analysed separately which is crucial to the decision of which maturities to include in the portfolio. The data are limited because in many countries there are no ro-



bust data available on “long-term” interest rates. Experience in trading these securities indicates that correlations are low *across* local interest rate markets as well as currency markets. However, there is a correlation between interest rates and the currency *within* a country that is taken into account in the following formula.

The additional risk added to a portfolio ( $\sigma_p$ ) from extending the maturity or duration<sup>21</sup> of investments in the  $i^{\text{th}}$  local currency securities can be measured by the following formula:

$$\sigma_{Di} = (w^2\sigma_c^2 + D^2\sigma_r^2 + 2w\rho D\sigma_c\sigma_r)^{1/2} \quad (4)$$

where  $w$  is the country weight,  $D$  is the contribution to duration,  $\rho$  is the correlation coefficient, and  $\sigma_c$  and  $\sigma_r$  are the standard deviations of the exchange rate and interest rate.

The decision of the optimal number of securities to include in a portfolio depends on the marginal benefit of the  $n^{\text{th}}$  security to the portfolio variance. There are perhaps 40 or more countries whose local currency securities are suitable for inclusion in an LCD portfolio. Both theoretical reasoning and empirical testing support the case that the marginal benefit to diversification declines as the number of securities is increased. The rate at which the benefits diminish will depend on the degree of independence of the returns so that a portfolio of completely independent securities will quickly overwhelm the benefits of diversification by eliminating all “unique” risk and leave only “systematic” or common risk. In actual markets there are degrees of independence and interdependence. As the marginal benefit diminishes, the transactions costs and portfolio management costs rise with the number of securities.

Empirical studies of the United States equity markets, as discussed in Sharpe (1970), estimate that a portfolio with 10 securities will have 7 per cent more risk than the minimum (i.e., that of the market portfolio without diversifiable risk) and a portfolio of 20 securities will have only 3 per cent more than the minimum. The actual determination of the optimal number of securities will depend on the correlations and the transactions costs required to obtain and manage such a portfolio.

Our preliminary analysis of data from emerging markets in the 1990s indicates that the benefits

to diversification flatten off after the nineteenth security. Thus, a portfolio of 20 securities would serve as a good estimate of the minimum number of securities necessary for diversification to be fully effective.

The decision on the weighting of securities in the portfolio can be driven by different motivations. One approach would be to treat the portfolio as if it were an index in which country weights replicated the share of the respective economy or the market size of the security’s issuance relative to the others represented in the portfolio.<sup>22</sup> Most, but not all, security indices in advanced capital markets are based on weights that reflect the market capitalization of the security. However, the size of local-currency debt markets is generally quite difficult to measure. Most securities are traded over the counter and include bank paper and even derivative products that are not easy to quantify. In addition, government securities markets can be extremely illiquid, with a proportion of the securities held by the central bank or the Treasury, so that the number of outstanding issuances is not a good indicator of the tradable size of the market.

Another approach, followed by the JP Morgan ELMI/ELMI+, is to weight countries by the size of their foreign exchange markets, as measured by total exports and imports. This approach avoids the problems in trying to estimate the size of the local currency markets. But it ignores the fact that liquidity in the local securities market has very little to do with the size of foreign exchange trading. The ELMI+ attempts to address this by including measures of liquidity in the index.

One of the results of this formulation is that countries in Asia represent nearly 40 per cent of the index, since they have the largest share of trade of countries in the investment universe. Yet, from a policy perspective, countries in Asia have the least need for foreign capital because of their high savings rates and because they have the least amount of sovereign debt denominated in foreign currency. This would reduce the effect of the proposal in solving the problem of “original sin”. From an investment perspective, yields in most countries in Asia tend to be low. Asian currencies also tend to be highly correlated owing to their high regional trade links. Thus, a portfolio based on this approach will tend to be a higher risk/lower return portfolio. The ELMI+ approach is consistent from the perspective of building a publishable index, but it is not the foundation of an optimal portfolio.

The optimal approach would be to choose weights that produce the desired return to risk trade-off in the portfolio. Under this approach, securities with high yields per unit of risk, or with low covariance with the portfolio, would be weighted more heavily than those with lower returns or higher covariance. This might result in a portfolio that contains relatively more securities from a small country or a country that exhibits greater volatility but whose returns are substantially uncorrelated from those of other countries. One important implication of this last point is that it has the positive effect of rewarding countries that successfully pursue independent policies and achieve independent results.

The complicating issue with this approach is the difficulty in estimating future returns, volatility, and correlations since the historical figures are not always good predictors of future returns.<sup>23</sup> This is especially problematic for currencies that have had fixed-exchange rate systems, because the past correlations and volatility do not convey the full risk inherent in the positions. The volatility of a fixed-exchange rate currency is historically zero, even if the risk of devaluation is significant. There are several ways to address this mathematically, and there are market indicators that can also be used to assess volatility and expected returns.<sup>24</sup>

Even if, for simplicity, the securities were equally weighted – that is, with weights of 5 per cent for a portfolio with 20 securities – a set of sufficiently independent security returns can outperform the return-to-risk of major security indexes. This is shown below.

## Track record

### *Experiments with investment in local currency debt*

The potential gains from investing in local currency debt securities were apparent by the mid-1990s and at least some parts of the private sector were aware of them. From 1993 to just prior to the Russian Federation crisis in July 1998, short-term yields on local currency debt averaged nearly 27 per cent. The primary risk to investing in local currency debt is currency volatility and so yields were high to compensate investors for the risk of devaluation. Yet the

actual average currency devaluation over the same period turned out to be only 14.5 per cent (authors' calculations using list of 46 countries, as shown in appendix B).

Whether it was a fundamental market failure or a matter of incomplete markets giving rise to arbitrage opportunities, there were cases of private sector investors attempting to take advantage of it. Many broker-dealers set up local currency trading desks and several asset management financial institutions, that is, “buy-side firms”, launched local currency funds.<sup>25</sup> In the summer of 1996, JP Morgan introduced the Emerging Local Markets Index (ELMI).<sup>26</sup>

Yet the ELMI, and later the ELMI+, never became a widely followed index. By the end of 1998 many of the new local market funds had shut down. Most had taken large and concentrated positions in a few developing countries – notably some large long positions in the Russian Federation – and when the Russian Federation defaulted the local market funds came to an end.

In contrast to the funds that made concentrated bets in a few countries, those that were constructed from a risk-control perspective survived the crisis relatively unscathed, with positive returns and low volatility.<sup>27</sup> The successful strategy lay in recognizing that, despite much of the popular discussion about currency contagion, correlations across emerging market currencies had been actually quite low. For example, returns from investing in local currency debt of 25 countries from JP Morgan's ELMI+ index returned an averaged 3.03 per cent monthly or 43 per cent annual rate of return over the five months from August through December 1998.

Highly diversified portfolios that were constructed to take advantage of the low correlations across emerging market currencies produced strong results, relatively high yields and low variance, throughout the various emerging market crises.

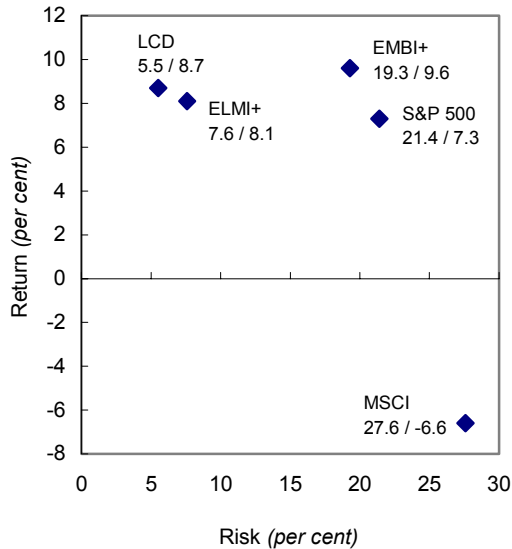
### *LCD track record*

In order to better illustrate the market risk of investing in local markets, we have created a sample LCD portfolio using JP Morgan ELMI+ data. For simplicity, our sample portfolio equally weights the countries in the index. We did not use the ELMI+

Chart 1

**RISK-RETURN PROFILE, 1994–2003**

(Percentage)



The second striking result is that the average risk of the LCD portfolio was only 5.5 per cent from 1994 through 2003, significantly lower than the EMBI+ risk of 19.3 per cent over the same period. For comparison, we have also listed the risk/return profile of the ELMI+, S&P 500, and Morgan Stanley Capital International (MSCI) Emerging Market Free Index of equities (chart 1).

It is important to note that the start date of 1994 has a significant effect on measured returns on all asset classes. If the data were to start a year earlier, or a year later, returns would be higher for all emerging market indices (chart 2).

Another important point that is not shown in chart 2 is that the volatility of the LCD portfolio is remarkably consistent over time. We tested the data for different start dates and found that the volatility of the LCD portfolio never goes above 6 per cent. This further exemplifies the power of diversification at lowering risk in this asset class. In contrast, the volatility of the EMBI+ jumps from slightly over 9 per cent to nearly 20 per cent, depending on whether the start date is before or after a crisis year.

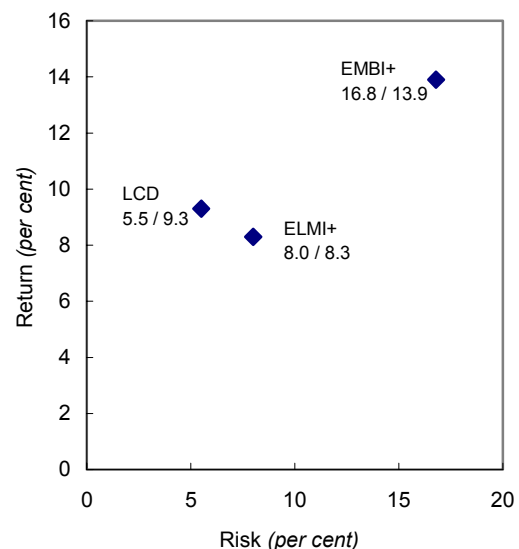
weights because, as we explained earlier, the ELMI+ is highly concentrated in Asia and thus is not optimal diversification. In addition, the ELMI+ includes major currency risks implicit in emerging market currencies tied to the euro and the yen. For example the local currency securities in Poland, Hungary and the Czech Republic embody exchange rate risk – when measured in dollar – that is closely tied to the value of the euro. As a result they are more highly correlated with each other than is desirable for the purpose of diversification.

The ELMI+ dataset starts in 1994, so we begin our analysis in that year. The first striking result of our LCD portfolio is that there is only one calendar year in which returns were negative. That year is 1997, the timing of the East Asian crisis, when the LCD portfolio was down -0.78 per cent. In 1994 (the year of the Mexican crisis), 1998 (the year of the Russian Federation crisis), and 2001 (the year of the Argentinean crisis) returns are all *positive*, at 3.2 per cent, 17.8 per cent, and 5.3 per cent. In contrast, the EMBI+ generated *negative* returns for those years of -18.9 per cent, -14.4 per cent, and -0.8 per cent.

Chart 2

**RISK-RETURN PROFILE, 1993–2004**

(Percentage)





Another comparison – and indeed contrast – that illustrates this point is one with the dollar returns on the FTSE – a sterling-denominated equity index. This portfolio is diversified across the 100 securities that make up the FTSE index, but it is not diversified with regard to foreign currencies because the dollar exchange rate with the sterling introduces additional risk to the FTSE equity index. The average annual returns over the same period (January 1995–January 2003) were 7.52 per cent and the standard deviation was 17.73 per cent. This represents a lower yield and higher risk than the LCD portfolio, and a lower yield for about the same level of risk for the S&P 500 – or alternatively about the same yield but much higher risk than a portfolio of the United States Aaa corporate bonds.

### Why the private sector has been slow to implement this strategy

If the LCD policy is such a good idea, why has the private sector been so slow to implement it? There are several answers. One is the disappointing history of local currency funds in the mid to late 1990s, which led investors to be wary of this asset class. Most of that disappointment can be attributed to funds that took large concentrated bets in a few countries, especially the Russian Federation, and thus did not maintain a diversified portfolio. Nonetheless, these have served as a bad example of local currency portfolios.

Another reason is that the one local currency index, the JP Morgan ELMI+, did not perform as well as a more diversified portfolio.

More recently, local currency capital markets in some countries have grown, spurring new investor interest in the asset class. A recent study by the IMF (2004a) documents several positive developments in the issuance and trading in local currency securities in developing countries. The study cites improvements in clearing trades in local currency securities and the settlement of payments for such trades. It also describes expanding liquidity in secondary markets for these securities, and it identifies the development of inter-dealer markets as a sign of great liquidity.

Another IMF report (2004b) describes a new initiative in Asia, called the Asian Bond Market Ini-

tiative. This initiative includes settlement and exchange regulation, a credit guarantee mechanism, issuance of local currency bonds by non-domestic issuers, and local rating agencies. Similarly, Mexico has begun to develop a liquid local currency bond market. The development of local pension funds in several Latin American countries, such as Chile, has also stimulated the development of domestic markets.

As local currency bond markets continued to develop, there has been more interest in local currency investments. This was apparent at the December 2003 Emerging Market Traders Association meeting at which there was a significant amount of discussion about the asset class. It is unclear, however, how much of any increased investment will go into diversified funds and how much will go into concentrated positions in the few large markets that are easily accessible to foreign investors.

Two of the biggest complaints by foreign investors are the difficulty of accessing some developing countries' local currency securities markets and the high transaction costs in those markets. Several countries have complicated tax structures, inefficient settlement mechanisms, high custodial costs, and outright restrictions to foreign investment. Foreign investors have pressured developing countries to reduce these transaction costs, but the countries have resisted doing so. Brazil, for example, has one of the largest domestic securities markets, but it is also a market where foreign investors find access cumbersome.

So, we need to ask the flip side of the questions, if local debt is so good for developing countries, why have they sometimes been slow to respond to foreign interest?

We believe that there are two main answers to this question. First, foreign currency financing is often cheaper than domestic financing the risks inherent in foreign currency financing are ignored. Second, it is possible that countries are wary of international institutional investors. These investors are seen as myopic, bringing in short-term hot money, overwhelming small capital markets in the good times, pulling out in the bad times and leading to boom-bust scenarios or currency crises. Such flows can add volatility to a local financial markets and disrupt if not destabilize the economy. In fact, the problems associated with short-term capital flows has been the focus of much economic policy litera-

ture in recent years.<sup>28</sup> Similar to concerns that excessive dollar debt is linked to crises, so too have open capital markets.<sup>29</sup>

In this light, market regulations and local security market inefficiencies can be viewed as a means of restricting capital flows. For example, in the early 1990s foreigners were not allowed to purchase Hungarian Government debt. Later, as the country moved towards joining the European Union, the restrictions were eased so that foreigners could buy debt securities with remaining maturities of more than one year.<sup>30</sup> In this Hungary was able to use controls on its local bond market to regulate short-term capital inflows.

On implication of this insight is that “original sin” is in some cases the result of policy decisions. Faced with a choice between two evils, opening their domestic markets to the vicissitudes of short-term capital flows or borrowing from abroad in foreign currency, developing countries have often chosen the later.

The question then becomes, is it possible to structure local currency portfolios to keep funds in a country long-term? Can we construct the portfolio in a way that still gives policymakers the option to continue to selectively use capital account regulations to limit short-term inflows? The example of Hungary gives us a hint of how this can be done. Even when foreigners were not allowed to access the local bond market directly, they were given the permission to buy into long-term closed-end funds.<sup>31</sup>

## Alternative ownership structures

Another virtue of the LCD portfolio approach to financing development is its flexibility and ability to take on many different structures to the ownership of the portfolio. The minimum size for an economically viable portfolio is not very large, so this would not sharply constrain its use by a variety of financial institutions. For example, a portfolio consisting of \$2 million in securities from each of 20 countries would amount to a \$40 million portfolio.

There are many financial institutions in advanced economies that are large enough to purchase and manage a portfolio such as the LCD portfolio, and most of these have the regulatory authority for

cross-border and foreign currency investments. These institutions could construct such a portfolio and hold it as an asset on their balance sheets. Pension funds and insurance companies could also operate such a portfolio as a portion of these assets. Similarly, mutual funds and hedge funds could offer more direct ownership of such portfolios. In all these cases, the most important point is that managers should stick to a diversified approach, and this feature could be enforced by including diversification as a requirement in the managed fund prospectus or pension fund investment guidelines.

Multilateral development banks such as the World Bank could employ this approach to manage the risk of lending to its developing country borrowers. The Bank’s portfolio is already diversified across lenders, and so this analysis shows how it could safely lend in local currency instead of its existing policy of lending in major currencies. Had the Bank been pursuing this approach all along, it would have played a much more stabilizing role in development finance than it has.

Yet another approach to ownership structure would be to securitize the LCD portfolio in a manner similar to that successfully pursued by United States mortgage lending titans Fannie Mae, Freddie Mac, and Ginnie Mae. They collect together financial assets into a pool that is held by a trust; the trust then issues securities known as mortgage-back securities that represent ownership shares of the pool of assets. These shares can then be traded in a liquid and transparent secondary market so that the process results in price discovery of the return and risk of the underlying mortgage investments. This attracts additional capital to the market, provides investors with greater diversification, and, most of all, helps the development of good standard market practices that are often lacking in the market for the underlying assets or securities.

A similar security that would be backed by other currency debt securities, call it an “LCDBS”, could be denominated in dollars or any currency. The trust could be structured to reinvest all proceeds in local currency debt and then authorized and empowered to convert the various local currency proceeds into the currency of denomination (e.g., dollars) in order to coupon payments on each scheduled payment date plus the payment of principal at maturity.<sup>32</sup> The choice of reinvestment versus regular coupon payments could vary so as to suit the preferences of the

investors. Some investors, such as pension funds and insurance companies, want the regular payments for cash flow or tax purposes, while other investors might prefer reinvestment at the internal rate of return of the portfolio.

As the great wit and sage Yogi Berra warned, “If you can’t copy them, don’t imitate them.” In this case, however, the application of this experience with mortgage-backed securities to local currency developing country debt is fairly straightforward and thus lends itself to imitation.

The high performance of the LCD portfolio, which compares favourably with the dollar return on major United States equity indices, United States corporate bond returns, and sterling-denominated FTSE returns, will attract portfolio capital from individual investors, managed funds, and financial institutions.

Of course, the LCD portfolio might attract additional investor interest if shares were sold on different classes of the portfolio. This is a common practice in the securitization of debt through structured securities, known as collateral debt obligations, where different tranches of the pool – based on the priority in which debt service payments fulfill debt obligation – are sold separately. This generates different classes of shares based on creditworthiness, such as a class AAA, a class BB, and junk class (i.e., speculative grade debt). However, since this LCD portfolio would not be burdened with very much credit risk – most developing countries enjoy high ratings for debt payments in their own currency – the different classes of shares would be differentiated based on market risk. Thus, Class A might offer a very high likelihood of providing an 8 per cent return in dollars, while Class B might offer a strong likelihood of 10 per cent and Class C might offer a speculative return of 14 per cent. Such structures have proven time and again in other areas of advanced financial markets to add significant value to the portfolio by tailoring the risk-return profile of the instrument.

## Economic and development consequences

The primary goal of helping developing countries borrow in their own currency is to reduce their exposure to foreign exchange risk, which has helped

trigger many financial crises in recent decades. But apart from this, there are additional important economic benefits of a widespread adoption of LCD portfolios and more local currency (and less foreign currency) debt issuance.

The macroeconomic benefits include:

- enabling developing countries to attract more foreign capital, and to do so in more steady volumes because the returns and risks will be more akin to those found elsewhere in advanced economies’ capital markets;
- raising the demand for local currency government securities, and by association other local currency securities, so as to lower the cost of capital in those markets;
- promoting improvements in local financial markets in the areas of clearing, settlements, and secondary market trading;
- stimulating investment and growth by lowering local currency interest rates and increasing the maturity and depth of local credit markets; and
- increasing the government’s revenue from seigniorage by increasing the use of local currency for trading and servicing local-currency-denominated assets; this together with lower borrowing costs, will improve the fiscal position of developing country governments.

The microeconomic benefits of the LCD portfolio include:

- it will create a new benchmark in international financial markets;
- the portfolio, by eliminating most if not all “unique” risk from each security, will establish the price of “common” or “systematic” risk in developing country debt markets;
- the new benchmark would “price” the “market risk” – inflation, nominal interest rates and exchange rate risk – of investing in developing country debt instead of the credit risk;
- this benchmark rate of return will have the effect of sharpening competitive pressures on international investors by identifying where local-currency rates of return exceed that justified by the benchmark; and

- the local currency interest rates and exchange rates will have the *excess* risk premiums priced out of them.

This new power to borrow abroad must come, however, with a strong warning. Some developing economies in the recent past have suffered because of their governments' fiscal imbalances – whereby large and persistent deficits were financed by borrowing that was subsequently monetized as part of monetary policy. The consequences for inflation, output and growth were sometimes dire. In this context, relaxing the constraints on developing country governments' ability to borrow in their currency is expected to raise concerns about the possible hazard of eliminating the usual discipline of foreign borrowing.

While expanding the market for local-currency financial instruments, the LCD policy will not necessarily reward any particular country for pursuing reckless fiscal or monetary policies, as it does not guarantee any particular country the right to sell its local currency securities abroad. It does though offer a reward for being able to do so, and the magnitude of the reward will be proportional to a country's ability to produce a stable economic environment with lower interest rates and low rates of currency depreciation. In this regard the policy does not eliminate any disciplinary “stick”, but rather it adds “carrots”.

## Conclusion

In this study, we describe how to construct a portfolio of emerging market local-currency denominated debt. This portfolio can generate United States dollar rates of risk-adjusted return that are competitive with familiar financial market benchmarks such as the S&P 500 and FTSE indexes.

This is a feasible proposal that can be readily adopted by private financial markets for its profitable opportunities, and yet it can also be promoted

at negligible expense through public policies by the G-7 Governments, the Finance for Development process at the United Nations and international financial institutions such as the World Bank. The latter could play a helpful role in establishing a demonstration project that would produce market information on prices, returns and risk that could stimulate others to follow. In addition, the project could help finance develop structures that would be valuable long-term investments.

By comparison to Hausmann's plan for an EM Index, this proposal stands as a simple and more straightforward policy, as it does not require the approval and active participation of major currency governments or international financial institutions such as the World Bank and IMF. It is also more flexible in that the portfolio approach can be used to construct a variety of types of portfolios that can be directly owned or securitized and can be sold off in uniform shares or in risk-related tranches.

This proposal stands as an implicit criticism of official financial institutions that for decades have failed to identify this policy opportunity that would allow them to use their already country diversified portfolio to lend in local currencies. Instead they have continued practised a policy of lending in major currencies that has lead to financial crises that resulted in more debt in major currencies to help developing countries adjust to shocks from changes in foreign exchange and interest rates.

Private financial markets too have overlooked, for the most part, this investment opportunity. In an industry that prides itself on its innovation and its top-flight financial analysis of arbitrage opportunities, this is a large, squandered opportunity. It is an example of the proverbial \$20 bill on the ground, which theoretical economists believe cannot exist.

This LCD portfolio approach has enormous potential to promote the maturation of local financial markets as a development policy. It has the capacity to not only reduce developing countries' vulnerability to financial crises, but also to foster greater stability and sustained development.



## Appendix A

### *Summary of EM Index proposal*

The recent literature on the causes, costs, and dangers of foreign currency borrowing, that is, the “original sin” literature, develops a policy proposal for redemption. The proposal in Hausmann et al. (2002) consists of three steps. First, construct an index (called an “EM Index”) to determine the rate of return on index-linked financial instruments (bank loans, bonds, and interest rate derivatives). The index is calculated using the changes in each country’s exchange rate and inflation rate and by weighting each currency in the index by the real output of the respective country.<sup>33</sup> The proposal calls for the World Bank to calculate the official index.

Second, the IFIs (official international financial institutions such as the World Bank and Inter-American Development Bank) would issue at least some of their debt denominated in the EM Index. This would enable those IFIs to lend in local emerging market currencies while maintaining a match between the currency denomination of the assets match and that of their liabilities. Similarly, the G-10 countries, would be called on to issue some of their debt in the EM Index.

The IFIs and G-10 borrowers, it is argued, would be motivated by the advantages of diversifying their liabilities or alternatively capturing savings after swapping their EM Index obligations back into their respective C-5 currency (dollar, euro, pound sterling, yen and Swiss franc). This would have the desirable consequence of creating an otherwise rare short position in the local currency. The third step would thus consist of having the developed countries swap out of C-5-currency-denominated debt back into their own local currency.

### *Problems with the EM proposal*

Following are some limitations of the EM proposal, as we see them:

1. The proposal is overly complicated relative to the problem it seeks to solve. It requires indus-

trial country governments to change their debt management policies to include the use of EM-Index-linked securities, foreign currencies, foreign-currency swap transactions, and adding exposure to swap related credit risk from counterparties. While the Government of Sweden has already been successfully developing more sophisticated debt management policies, these policy recommendations stand in stark contrast to the debt management policies in such countries as the United States. Such a change in policy might not prove to be directly beneficial to the United States, Japan, and euro zone Governments. For example, the policy change would disrupt, and thereby diminish the benefits from, regularly scheduled debt auctions. Also, the proposal would require the G-10 Governments to borrow in a foreign currency and swap back into their own currency at time when it might – as well as when it might not – be cheaper to borrow in their own currency.

2. Individual developing countries would still not be borrowing directly in their own currency.
3. The most immediate benefit to developing currencies from the emergence of the EM Index would be more (long positions in) foreign currency swaps that would enable them to swap out of their hard-currency foreign debts and other obligations.
4. The EM Index proposal does not clarify how the index-linked debt and securities are to be bought, sold, or in general traded. The transaction must be denominated in some single currency unless the proposal’s proponents want the entire basket of currencies to be used. It would be impractical to buy and sell securities that require multiple currencies for engaging in price quotes, negotiations, and settlement. If the EM Index is comprised of 22 currencies, as language in the literature suggests, it will require a basket of 22 currencies to buy or sell. Otherwise, if it is traded in dollars then it will not *directly* help emerging market countries borrow in their own currency or reduce their foreign currency exposure – although it would give them a more diversified exposure.

## Appendix B

List of 46 developing countries included in foreign exchange rate analysis:

Argentina	Bangladesh	Botswana
Brazil	Bulgaria	Chile
Colombia	Côte d'Ivoire	Croatia
Czech Rep.	Ecuador	Egypt
Estonia	Ghana	Hungary
India	Indonesia	Israel
Jamaica	Jordan	Kenya
Lebanon	Lithuania	Malaysia
Mauritius	Mexico	Morocco
Namibia	Nigeria	Pakistan
Peru	Philippines	Poland
Rep. of Korea	Romania	Russian Federation
Slovakia	Slovenia	South Africa
Sri Lanka	Thailand	Trinidad & Tobago
Tunisia	Turkey	Ukraine
Venezuela		

## Notes

- The term major currency refers to the C-5, the dollar, euro, yen, pound sterling and Swiss franc.
- See Dodd (2001) for an analysis of this dimension of the problem.
- One of the authors of this paper, Shari Spiegel, developed and managed a successful risk-controlled diversified local currency debt portfolio in 1995 at Lazard Asset Management.
- The article will use IMF definitions for terms such as advanced economies and emerging market economies, but will use the term developing countries to refer to both emerging and developing countries.
- This is also true for most other emerging market economies and some newly industrialized economies.
- The numbers add to slightly more than 100 per cent due to rounding.
- Stiglitz (2003).
- For a more thorough discussion of these points see Dodd (1989), Allen et al. (2002), and Goldstein and Tucker (2004).
- Funds that could be used for development are instead held as reserves. For example, a country might borrow at 10 per cent, but then need to hold reserves against this debt in the United States Treasuries at, say, 3 per cent. For more on this, see the upcoming Initiative for Policy Dialogue Overview book on Macroeconomics and Capital Markets Liberalization, forthcoming from Oxford University Press.
- For a detailed discussion of this, see the upcoming Overview Volume on Macroeconomics and Capital Market Liberalization by the Initiative for Policy Dialogue:
- Ffrench Davis R, Nayyar D, Ocampo JA, Spiegel S, and Stiglitz J, forthcoming from Oxford University Press.
- The term was coined in Eichengreen and Hausmann (1999).
- Eichengreen and Hausmann show econometrically that a weak policy framework is not the primary reason countries have been unable to issue debt in domestic currencies; hence the term, "original sin".
- Goldstein M and Tucker P (1996).
- The Lazard Strategic Yield Fund, May 1995 to April 1997. The Lazard Emerging Income Fund 1, from April 1997. The strategy was developed to maintain exposure to local emerging market currencies, and minimize the currency risk through diversification.
- The foundation of portfolio theory in the words of one of the great contributors to the theory is Sharpe (1970).
- The term security will be used to describe government debt instruments, although the portfolio could potentially contain government loans.
- Yield and volatility data are taken from average yields published by the JP Morgan as part of the ELMI+ index, 1994–2003.
- The term short-hedger refers to an investors whose business normally involves a long position in the local currency and needs to hedge that exposure by taking a short position in the derivatives market.
- Our data for these series were monthly, starting in January 1994 and ending in May 2004, although some countries do not have observations for the entire period.
- The dollar is chosen as an example. The same would be true for other currencies. The rate of return refers to the sum of interest payments and any change in price of the security. This equation yields a continuous time version:  $r = r^* + \dot{e} + r^* \dot{e}$ .
- Duration is the weighted average of the maturity of the sum of the bond's cash flows, with the weights calculated by the present value of the corresponding cash flows. It reflects the marginal interest rate risk owing to convexity.
- This approach to weights is in contrast to that of Hausmann et al. for their EM Index approach (appendix A), in which the index weights are decided by GDP. That would result in the largest countries having the largest impact on the index and their currencies being in greater demand in subsequent transactions. This would replicate and reinforce one of the causes of "original sin", namely, the size of the economy.
- A succinct warning could be drawn from Yogi Berra's observation that "the future is not what it used to be".
- One tested method is to use a jump diffusion model instead of a normal distribution. While this approach is useful in determining optimal weights, the results do not alter the general portfolio thesis.
- To name a few: Lazard Asset Management launched a Local Currency Trust in 1995, ANZ Asset Management and Morgan Stanley Asset Management launched funds soon thereafter, and other asset managers launched regional funds.
- The ELMI was later supplemented by the ELMI+. The new index includes more countries and uses currency forwards to estimate local yields.
- The Lazard Asset Management Local Currency Trust and affiliated funds is the one fund the authors know of that maintained a diversified investment strategy, based on a risk-management perspective.

- 28 Rodrik D and Velasco A (2000).  
 29 World Bank (2000); and Demirguc-Kunt A and Detragiache E (2001).  
 30 Eventually the market was made fully open.  
 31 One of the authors, Shari Spiegel, also managed one of the first local currency fixed income closed-end funds in the Hungarian domestic market in the early 1990s. One tranche of the fund was open to foreign investors.  
 32 Note that mortgage-backed securities involve a similar process of collecting receipts from the many mortgages in the portfolio, whose payments fall across many different dates, and then efficiently managing these cash flows until they are paid out on regularly scheduled payment dates.  
 33 Real output is measured by the purchasing power parity (PPP) value of the gross domestic product (GDP) and inflation is measured by the consumer price index (CPI).

## References

- Allen M, Rosenberg C, Keller C, Setser B and Roubini N (2002). "A Balance Sheet Approach to Financial Crisis", IMF Working Paper (Policy Development and Review Department) WP/02/210, Washington, DC.
- Bacha E and Diaz-Alejandro C (1982). "International Financial Intermediation: A Long and Tropical View", Essays in International Finance, #147, Princeton: Princeton University.
- Demirguc-Kunt A and Detragiache E (2001). "CML is correlated with banking crises", "Financial Liberalization and Financial Fragility", in Gerard Caprio, Patrick Honohan and Joseph E. Stiglitz (eds.) *Financial Liberalization, How Far How Fast?*, Cambridge University Press.
- Dodd R (2001). "The Role of Derivatives in the East Asian Financial Crisis", In Lance Taylor and John Eatwell (editors), *International Capital Markets: Systems in Transition*. Oxford University Press (2002), *The Financier*, Vol.7, Issue 4, 2001.
- Dodd R (1989). "Risky Foundations of Development Finance", manuscript presented at the Eastern Economics Associations conference in Baltimore, MD, March 1989. (available at [www.financialpolicy.org/dscwriting.htm](http://www.financialpolicy.org/dscwriting.htm)).
- Eichengreen B and Hausmann R (2003). "Original Sin: The Road to Redemption", unpublished manuscript, available at <http://ksghome.harvard.edu/~rhausma.cid.ksg/Original%20Sin/roadtoredemption2003.pdf>.
- Eichengreen B and Hausmann R (1999). "Exchange Rates and Financial Fragility", Paper presented at symposium, *New Challenges for Monetary Policy*, hosted by Kansas City Federal Reserve Bank.
- Eichengreen B, Hausmann R and Panizza U (2002). "Original Sin: The Pain, the Mystery, and the Road to Redemption", unpublished manuscript, November 2002, available at <http://ksghome.harvard.edu/~rhausma.cid.ksg/>.
- Goldstein M and Tucker P (2004). "Controlling Currency Mismatches in Emerging Markets", Washington, DC, Institute of International Economics.
- Goldstein M and Tucker P (1996). "Banking Crises in Emerging Economies: Origins and Policy Options", BIS Economic Papers, No. 26 (October).
- Goodman L (1980). "The Pricing of Syndicated Eurocurrency Credits", *Quarterly Review* Federal Reserve Bank of New York (Summer).
- Goodman L (1981). "Bank Lending to Non-OPEC LDCs: Are Risks Diversifiable?" *Quarterly Review* Federal Reserve Bank of New York (Summer).
- Hausmann R (2002). "Good Credit Rations, Bad Credit Ratings: The Role of Debt Denomination", unpublished manuscript, Harvard University, available at <http://ksghome.harvard.edu/~rhausma.cid.ksg/>.
- Hausmann R, Panizza U and Stein E (2001). "Why Do Countries Float the Way They Float?" *Journal of Development Economics*, 66: 387–414. Also, Inter-American Development Bank Working Paper #148, May 2000, available at <http://ksghome.harvard.edu/~rhausma.cid.ksg/WP/pubWP-418.pdf>.
- International Monetary Fund (2004a). *Emerging Local Securities and Derivatives Markets*, World Economic and Financial Surveys (from the Global Financial Stability Report), Washington, DC.
- International Monetary Fund (2004b). *Global Financial Stability Report: Market Developments and Issues*, Washington, DC.
- Lessard D (1983). "The Implications for Multinational Banking", *Journal of Banking and Finance*, 7, pp. 521–536.
- Levy W (1980). "Oil and the Decline of the West", *Foreign Affairs* (Summer).
- Pollack G (1974). "The Economic Consequences of the Energy Crisis", *Foreign Affairs* (April).
- Rodrik D and Velasco A (2000). "Short-Term Capital Flows", in *Annual World Bank Conference on Development Economics, World Bank, 1999*, Boris Pleskovic and Joseph Stiglitz (eds.), Washington: World Bank.
- Sharpe W (1970). *Portfolio Theory and Capital Markets*, New York: McGraw-Hill Book Company.
- Stiglitz J E (2003). "Whither Reform? Towards a New Agenda for Latin America". The 2003 ECLAC Prebisch lecture published in *CEPAL Review*, No. 80, August, pp.7–38.
- World Bank (2000). *Global Development Finance 2000*, "Short-term flows and vulnerability", Washington: World Bank.

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