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11

*Short-Term Debt
and Financial Crises*

BETWEEN 1990 AND 1997, the outstanding short-term claims by BIS banks on developing countries nearly tripled, rising from \$176 billion to \$454 billion. This buildup in short-term foreign debt is widely believed to have played an important role in precipitating the recent financial crises in Mexico, East Asia, and Russia. U.S. Treasury Secretary Lawrence Summers has cautioned that “countries are courting trouble when they reach for short-term capital. . . . Longer-term debt is the simplest and best kind of insurance,”¹ and Jason Furman and Joseph Stiglitz have warned that “virtually any country that has excessive levels of short-term debt relative to reserves can suffer a self-fulfilling balance of payments crisis if its creditors refuse to roll-over these loans.”² Some observers believe that the level of short-term debt (relative to international reserves) is a reliable leading indicator of vulnerability to crises, since this component of capital flows can quickly reverse direction at the first sign of trouble in an economy. If true, such reversibility of short-term capital flows during

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1. Summers (1999).
2. Furman and Stiglitz (1998).

times of adverse shocks is contrary to the notion of consumption smoothing, which has always been an important argument in favor of global financial integration.

This paper addresses three important issues relating to short-term debt. First, it examines the factors that may be associated with the growth of short-term debt, with a view to understanding the benefits and risks of such debt. Second, it analyzes the behavior of short-term debt flows during times of favorable and unfavorable shocks. Finally, it examines the association between short-term debt and a country's vulnerability to liquidity crises.

In the section that follows, we describe some key features of short-term bank lending to the developing countries in the 1990s. In the third section, we undertake an empirical examination of various factors that are believed to influence the maturity structure of debt. The fourth section discusses the behavior of short-term debt during economic shocks, followed by an investigation of the association of short-term debt with financial crises in emerging economies. The paper concludes with a summary of findings. The appendix provides a brief discussion of the coverage (and shortcomings) of data on short-term debt.

Growth of Short-Term Debt in the 1990s

Broadly speaking, short-term debt comprises all cross-border debt with maturity of one year or less. Currently two conventions further define short-term debt. The Bank for International Settlements (BIS) uses the remaining maturity concept, according to which all cross-border debt becoming due within a year is counted as short-term debt. This includes liabilities with an original maturity of one year or less, as well as repayments falling due within the next twelve months on liabilities with an original maturity of more than a year. This concept is therefore useful for evaluating a country's total short-term external payments obligations (in other words, the liquidity position). Under the definition adopted by the Global Development Finance (GDF) report of the World Bank, by contrast, short-term debt comprises all cross-border liabilities that have an original maturity of one year or less. This definition highlights the amount of short-term debt contracted at the margin. The GDF definition also includes trade credits reported by the Organization for Economic Cooperation and Development (OECD).

The 1990s marked a boom in short-term lending by international banks to developing countries that lasted until the series of financial crises that began in 1997. The total debt of developing countries rose by approximately 60 percent—from about \$1.5 trillion in 1990 to \$2.3 trillion in 1997. During the same period, outstanding short-term debt by remaining maturity (the BIS definition of short-term debt) grew nearly 160 percent—from \$176 billion to \$454 billion. As a result, the share of short-term claims in total debt by BIS-reporting banks increased from 12 percent in 1990 to 20 percent in 1997 before declining to 15 percent in 1998, as short-term debt flows reversed dramatically in the aftermath of the financial crises (see table 11-1). Short-term debt also rose relative to other critical variables that indicate liquidity and debt-servicing capacity: exports and reserves. The ratio of short-term debt to exports in developing countries increased from 21 percent to 27 percent during the 1990–97 period. Whereas the average ratio of short-term debt to reserves declined markedly during the late 1980s for all developing countries and remained relatively stable during the 1990s—largely because of the decline in short-term debt to Latin America after the Brady bond conversions and larger additions to reserves—it remained precariously close to 1, the critical safe threshold identified in many studies.³ In East Asia short-term debt not only exceeded the safe threshold but increased dramatically during the 1990s until the financial crisis of 1997–98.

The fastest growth in short-term debt occurred in East Asia and the Pacific, where between 1990 and 1996 the share of short-term debt in total debt outstanding rose from 20 percent to a peak of about 32 percent. The rapid buildup of short-term debt in this region is evident in the ratio of short-term debt to exports and even more dramatically in the ratio of short-term debt to reserves, which increased from 124 percent in 1990 to 214 percent in 1997. Although short-term debt also grew rapidly in Latin America between 1990 and 1997, albeit at a slower pace than in East Asia, the Latin American countries' larger additions to reserves helped to hold down the ratio of short-term debt to reserves. Between 1994 and the first half of 1997, 45 percent of all short-term debt flows went to East Asia and the Pacific; 31 percent went to Latin America and the Caribbean countries. The top ten recipients of short-term loans during this period were South Korea (with 15 percent of the total), Thailand (11 percent), Brazil (10 percent),

3. See, for example, Furman and Stiglitz (1998) and Rodrik and Velasco (1999).

Table 11-1. *Growth of Short-Term Debt in the 1990s*

Type of short-term debt	1986	1990	1994	1995	1996	1997	1998
Short-term debt (GDF) (U.S. \$billions) ^a	154.2	244.6	360.5	424.4	460.8	469.3	411.9
Short-term debt (BIS) (U.S. \$billions) ^b	159.9	175.6	293.9	351.9	410.6	454.1	369.1
Short-term debt (GDF)/total debt (percent)	14	17	18	20	21	20	16
Short-term debt (BIS)/total debt (percent)	14	12	15	16	18	20	15
East Asia and Pacific	16	20	25	29	32	30	18
Latin America and Caribbean	19	14	17	17	19	22	20
Short-term debt (BIS)/exports (percent)	33	21	25	25	26	27	23
East Asia and Pacific	26	24	28	30	33	29	n.a.
Latin America and Caribbean	76	39	44	39	42	45	44
Short-term debt (BIS)/reserves (percent)	198	119	91	91	88	91	68
East Asia and Pacific	181	124	123	143	153	214	92
Latin America and Caribbean	257	143	101	86	84	91	93
Memo items (U.S.\$billions)							
Total debt outstanding of low- and middle-income countries	1,132.40	1,460.30	1,969.10	2,139.50	2,229.40	2,326.40	2,536.10
Exports of goods and services to developing countries	483.7	818.2	1,154.60	1,414.10	1,566.00	1,693.40	1,633.00

Sources: World Bank, GDF reports, various years; Bank for International Settlements.

n.a. Not available.

a. The GDF definition of short-term debt uses the original maturity concept and includes suppliers' credits.

b. The BIS definition of short-term debt uses the remaining maturity concept.

Indonesia (8 percent), Mexico (8 percent), China, Argentina, Russia, South Africa, and Malaysia (5 percent or less).

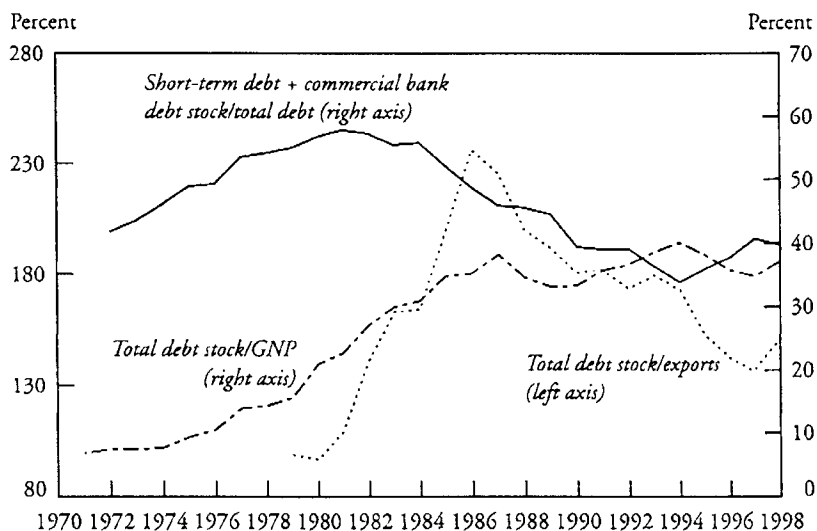
Short-term lending by international banks to developing countries during the 1990s increased rapidly despite a falling share of their lending in total private-debt flows and despite flat or declining ratios of indebtedness to exports and GNP in the developing countries.⁴ The situation was very different from that of the 1970s, when international banks were the main source of private capital flows to all developing countries. Bank lending rose sharply during the years of the oil price increases as international banks recycled petrodollars from oil-exporting to oil-importing countries (see pp. 347–48). Following the collapse of such lending in the wake of the debt crisis of the early 1980s, international bank lending to developing countries fell precipitously. The 1990s witnessed a renewed upsurge in private capital flows but this time in the form of foreign direct investment (FDI), international bond placements, and portfolio equity flows.⁵ As a result, the share of bank lending in total debt outstanding to developing countries fell continuously until about 1995 (figure 11-1). Developing country indebtedness surged during the 1970s and the first part of the 1980s, but the debt-to-GNP ratio has remained virtually flat since 1988, whereas the debt-to-exports ratio has declined sharply since the mid-1980s. The growth in the short-term debt of developing countries in the 1990s thus reflected the fact that international banks were lending more short-term funds while reducing their overall loan portfolios to developing countries as well as their capital-risk exposure.

Figure 11-2 shows the shortening of maturity of international bank lending to all developing countries during the 1990s, until the spate of global financial crises that began in 1997.⁶ By 1997 close to 60 percent of all outstanding international bank claims on developing countries had a remaining maturity of less than one year, and some 50 percent of all new loans from international banks were being contracted on original maturity terms of a year or less. Regulatory distortions and cyclical influences were important reasons (among others) for this shift (see pp. 336–37). The result was that developing countries, especially in East Asia, became increasingly reliant on rollovers in short-term external debt and therefore

4. Although external indebtedness remained flat or declined in developing countries in the 1990s, it increased significantly in most transition economies during the same period.

5. See World Bank (1993, chap. 1); and Mussa and others (1999).

6. The data on remaining maturity of bonds also show a rising trend in the proportion of short-term bonds for all regions between 1985 and 1998: see Mussa and others (1999).

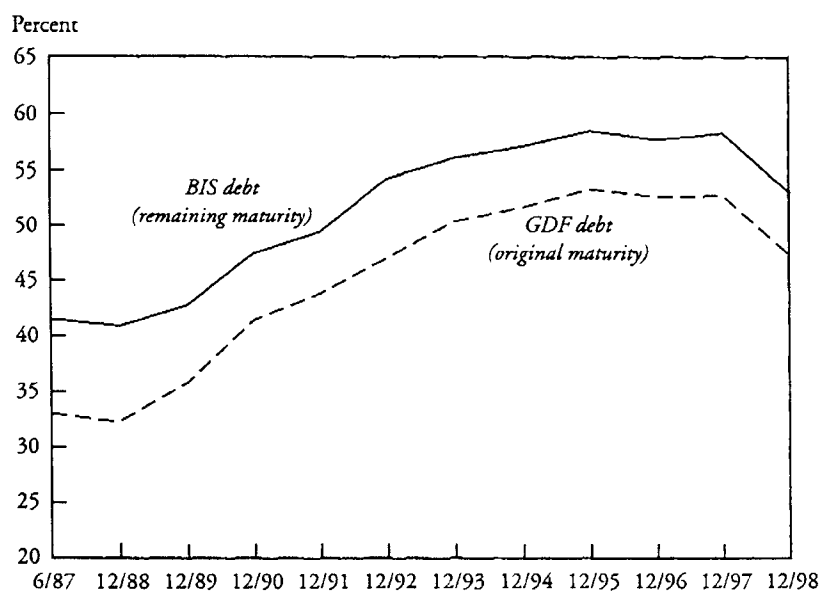
Figure 11-1. *Debt Stock Trends of Developing Countries, 1971-98*

Source: World Bank Debtor Reporting System.

found themselves particularly susceptible to liquidity crises provoked by any sort of shock to international investors' confidence.

The other noteworthy trend in flows of bank debt in the 1990s was a substantial increase in the share of private sector borrowings, especially interbank transactions. Unfortunately, although BIS publishes the allocation of total bank claims to public agencies, commercial banks, and the private nonbanking sector in developing countries, very little information is available on the sectoral allocation of short-term debt. However, an examination of the subset of syndicated loan transactions reveals that in recent years more than 42 percent of short-term syndicated loans to emerging markets went to financial institutions (see table 11-2). Nearly a third of short-term syndicated debt was contracted by commercial banks. The shares of short-term debt contracted by oil and gas enterprises and by government agencies fell significantly relative to the situation a decade earlier, while the short-term debt of financial institutions increased.

Interestingly, external short-term debt (as a share of international bank lending to developing countries) going directly into the property sector has always been small, even though domestic credit to this sector has increased rapidly in recent years. This is consistent with the view that cross-

Figure 11-2. *Short-Term Debt as a Percentage of Bank Lending to Developing Countries, 1987-98*

Source: Bank for International Settlements; World Bank Debtor Reporting System.

Table 11-2. *Sectoral Breakdown of Short-Term Syndicated Lending to Emerging Markets, 1980-99*

Percent

Sector	1980-84	1985-89	1990-94	1995-99
Financial institutions	8.1	24.7	32.7	42.2
Commercial banks	7.8	23.8	19.2	29.5
Commercial and industrial	55.7	53.4	46.2	36.3
Oil and gas	15.8	31.4	17.2	12.7
Property	0.3	0.0	0.9	0.7
Agribusiness	5.5	10.5	10.8	3.0
Utilities	14.1	0.0	3.2	7.2
Transportation	2.7	3.8	7.1	2.3
Government/agencies	11.1	18.0	10.2	11.8
Other	8.4	0.0	0.6	0.2

Source: Capital Data Loanware.

border intermediation by international banks to high-risk property sectors is exceedingly rare because of information and enforcement problems. Instead, domestic banks in emerging markets—especially in East Asia—borrowed short-term foreign debt at relatively low interest rates and on-lent to property companies (and others) at significantly higher rates. Such borrowing and lending activities involved risks of currency devaluation and maturity mismatch between assets and liabilities, but these were indirectly encouraged by pegged exchange rates and the belief that economic growth and asset booms would continue for a long time.

Determinants of Short-Term Debt

Several factors may have influenced the shortening maturity structure of international bank lending to developing countries during the 1990s. Examining these factors allows us to evaluate the risks and benefits of the growth in external short-term debt. The clearest benefits flow from the ability to match the maturity of an asset with the currency in which it is denominated (for example, inventories of imported raw materials or export accounts receivable in foreign currency). But if short-term debt is used for investments of longer maturity denominated in domestic currency, the liquidity and currency risks associated with such borrowing rise correspondingly. Moreover, it is the final use to which the money is put at the margin that determines the ability to repay the debt and that is therefore relevant for risk assessment.

Risks and Benefits of Shorter-Term Maturities

One reason that banks in industrial countries engage in short-term lending to emerging markets is that longer maturities carry greater risks. This is reflected in the pricing of debt: typically, the shorter the term of a loan, the lower the interest rate. Short-term lending by banks may also simply reflect the fact that a large share of the liability side of a bank's balance sheet consists of short-term deposits. From the perspective of borrowers in a developing country, short-term borrowing provides the advantage of lower interest rates, and to the extent that such short-term borrowing is used to finance short-term working capital needs (such as trade financing), the associated risks are low. Short-term lending, then, provides benefits to borrowers and reasonable returns to lenders, but in practice lending and bor-

rowing decisions may also reflect the influence of policy-induced distortions and cyclical factors that may lead to excessive risk-taking and short-term borrowing.

On the basis of a survey of literature and interviews with several commercial bankers, we outline in table 11-3 a number of factors that in principle may affect the maturity structure of lending by international banks and borrowing by developing countries. These factors are summarized using a three-way classification: cyclical, structural, and policy factors and, within each of these categories, push versus pull factors, although the categories are by no means watertight. We have also tried to identify policy-induced distortions or cyclical influences that may have led to excessive and more risky forms of short-term borrowing, as distinguished from other factors that were more structural and market-driven. Many of these push-and-pull factors have been shown to have influenced the *level* of debt and nondebt capital flows to developing countries. The discussion that follows shows that these factors may have also affected the *maturity* of bank debt flows to developing countries by causing a larger change in short-term debt than in longer-term debt.⁷

STRUCTURAL FACTORS. Since the mid-1980s, the emerging market economies have undergone dramatic structural changes. The latter half of the decade saw a resolution of the debt crises in Latin America and the restoration of market access. During this period East Asia recovered from the sharp recession of the mid-eighties. Many countries in both regions began a process of comprehensive structural reforms, including lowering barriers to external trade, opening up domestic sectors to foreign investment, and liberalizing their capital accounts, which permitted greater mobility of capital; the reforms continued into the early 1990s. Many countries deregulated their banking sector, allowing banks to borrow from abroad and to lend to domestic customers; with the privatization of public enterprises, public debt gave way to private debt, and governments in emerging markets—particularly those in East Asia—began to pay off debt using fiscal surpluses. Soon, several countries received favorable ratings; rising per capita income and falling indebtedness, along with investor-friendly policies, improved these countries' access to global capital markets.

7. For example, the effect of cyclical drivers (international interest rates) on the share of short-term debt in total debt is much stronger than its effect on the level of longer-term debt in the 1990s (the respective coefficients are -0.5 and -0.01). The remaining maturity definition of short-term debt used here complicates this conclusion but does not alter it.

Table 11-3. *Determinants of the Maturity of Bank Lending to Developing Countries*

<i>Determinants</i>	<i>Structural factors</i>	<i>Cyclical factors</i> ^a	<i>Institutional and policy factors</i> ^a
Pull factors	<p>Greater openness to trade leads to higher trade credits</p> <p>Deregulation of domestic sectors permitting foreign investment leads to higher requirement for shorter-term working capital finance</p> <p>Rising per capita incomes and declining indebtedness improves access to international financial markets</p> <p>Financial development leads to a deeper domestic debt market</p>	<p>High interest rates and rapid growth in emerging markets, often accompanied by high returns from asset booms, attract short-term capital inflows</p> <p>Lower interest rates abroad encourage substitution of domestic loans by external borrowing</p>	<p>Tax and other incentives for short-term borrowing (for example, BBE)</p> <p>Deregulation of domestic banks without adequate prudential regulations</p> <p>Rapid capital account liberalization enables domestic borrowers to access the international capital markets</p> <p>Sterilization of capital inflows maintains high interest rate differential while preventing nominal currency depreciation</p> <p>Bailouts of banks by central banks (for example, in Thailand) create moral hazard</p>
Push factors	<p>New technology and telecommunications improve information sharing, reduce transaction costs, and encourage short-term trading</p> <p>Technical innovation and new financial instruments improve risk monitoring and management of complex portfolios</p>	<p>Low interest rates and low growth in industrial countries encourage investment in developing countries</p>	<p>Existing BIS regulation on capital adequacy encourages short-term exposures</p> <p>International rescue packages (as in Sweden 1992, Mexico 1995) target short-term loans first, leading to a moral hazard problem</p>

a. Policy-induced distortions or cyclical influences that may have contributed to short-term overborrowing.

Opening the capital account facilitates investment flows of all kinds, but it particularly tends to favor short-term debt flows over longer-term flows. On the one hand, it facilitates frequent trading activities in financial markets and allows investors to take advantage of interest rate differentials; on the other hand, by allowing foreigners to own domestic equity, it leads to the substitution of non-debt flows for longer-term bank loans. The share of short-term debt in total debt therefore tends to rise when restrictions on capital account transactions are lifted.

The 1990s were a period of important change among the industrial countries as well. The technological revolution improved communication and information-sharing between emerging markets and investors in developed countries. This, together with technical innovation and the emergence of new financial instruments, facilitated more productive and more rapid portfolio risk assessment across a wider range of asset classes. Against the backdrop of declining returns as the industrial economies entered a cyclical recession, international banks intensified their search for profits in the developing countries.

These structural changes in both industrial and the emerging economies set the stage for a surge in private capital flows to the developing world. These changes were particularly favorable for short-term flows. An increasing level of international trade meant a larger volume of short-term trade credits. Higher FDI flows were invariably accompanied by a larger demand for short-term working capital financing. The search for rapid returns encouraged frequent trading and liquid (short-term) investments, facilitated on the one hand, by faster and cheaper communication and, on the other, by more efficient computing power and financial tools that gave rise to more reliable systems for settling trades, enabled richer modeling of risk, and greatly reduced transaction costs.

Industrial country lenders extend credit to short-term suppliers in order to finance imports (typically essential commodities such as oil, food, and medicine) by developing countries. By definition, a positive relationship is expected between trade openness and short-term debt.⁸ However, Dani Rodrik and Andrés Velasco find no such relationship; in fact, their estimated coefficient on the imports/gross domestic product (GDP) ratio is negative, suggesting that more open economies tend to engage to a lesser degree in short-term borrowing.⁹ They argue that a higher degree of trade

8. Gooptu and Martinez Peria (1992).

9. Rodrik and Velasco (1999).

openness improves a country's creditworthiness, as well as its access to medium- and long-term financing. While this would also improve access to short-term financing, the net effect on maturity composition of debt could go either way.¹⁰

By reducing taxes on profits, eliminating barriers to entry by new companies, and allowing more foreign ownership of domestic equity, the deregulation of domestic industries promoted FDI flows to emerging markets during the 1990s. This was helped to a great extent by the liberalization of capital accounts, which allowed freer mobility of capital than before. This process tilted the maturity of debt toward the short-term in two ways: first, short-term debt tended to rise (in association with FDI, for example); second, longer-term bank debt declined or did not rise to the same extent when it was converted to equity and FDI at the margin.

The level of indebtedness (indicated by the debt-to-GDP ratio) also has a positive influence on short-term debt, albeit with a time lag. At one level, under the remaining maturity concept, higher debt levels mean more that debt is coming due over the short-term; this also implies a greater need to roll over or contract short-term debt (that is, the demand for short-term debt under the original maturity concept is also higher). At another level, indebtedness exceeding certain thresholds increases country risk and reduces access to longer-term financing, thus raising the share of short-term debt in total debt.¹¹ By definition, a higher level of medium- and long-term debt would imply a relatively smaller share of short-term debt.¹²

CYCLICAL FACTORS. Low interest rates in industrial countries during the 1980s and 1990s are widely credited as the most important push factor behind the global liquidity expansion and capital flows to the developing countries (see figure 11-3).¹³ The absence of opportunities at home as their economies became mired in cyclical recessions prompted investors in developed countries to look outward and discover emerging markets that were experiencing rapid growth and offering very high rates of return (often accompanied by asset booms). Many of these economies needed

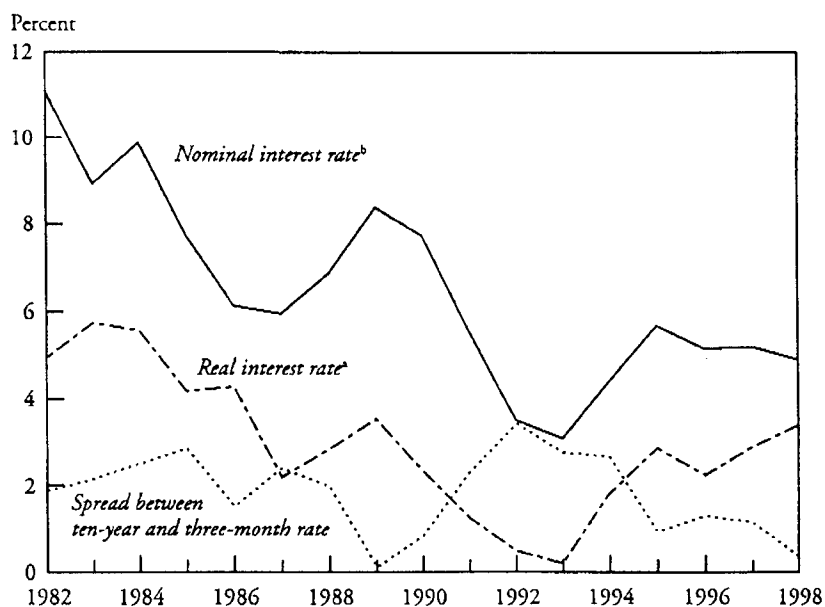
10. The main weakness in this argument is that higher imports may not necessarily be associated with an improvement in creditworthiness if the result is a higher current account deficit.

11. Rodrik and Velasco (1999).

12. Gooptu and Martinez Peria (1992).

13. World Bank (1997); Chuhan, Claessens, and Mamingi (1993); Dasgupta and Ratha (1999); Eichengreen and Mody (1999); Sarno and Taylor (1999); Montiel (1993); and Mussa and others (1999).

Figure 11-3. U.S. Interest Rates, 1982-98



Source: Bloomberg.

a. Three-month rate minus CPI inflation.

b. Three-month rate.

credit from abroad to finance high investment rates (which were in excess of already high savings rates, particularly in Asia) and decided to borrow short-term in order to take advantage of the relatively low interest rates.

Why does a lowering of interest rates and expansion of liquidity promote lending at the short end? The answer seems to lie in the nature of the yield curve: a reduction in the short-term rate does not always lead to a proportionate decline in long-term rates because expectations about long-term inflation and growth (and risks in general) are revised at a much slower pace than short-term expectations. Therefore, a reduction in short-term rates would encourage shorter-term borrowing.

INSTITUTIONAL AND POLICY FACTORS. One would expect that domestic monetary policies pursued in the developing countries as well as developments in prudential regulation in G-10 countries would have affected the maturity structure of debt. Sustained growth in East Asia during the 1986-96 period led to overconfidence on the part of lenders and

borrowers alike. Credit risk mechanisms became relaxed because of excess liquidity and euphoria in emerging markets. A large number of banks borrowed short-term to on-lend to domestic customers with medium- or long-term maturities. Such asset-liability mismatches were encouraged by the tendency of many central banks in developing countries to peg exchange rates and engage in massive sterilization efforts (to maintain a high interest rate differential and attract capital inflows). Some countries even actively promoted short-term borrowing to take advantage of low interest rates in industrial countries (the Bank of Thailand, for example, initiated the Bangkok Interbank Facility [BIBF] in 1993). Other countries (notably South Korea) discouraged long-term foreign investments for political reasons, which had the effect of shortening debt maturity. Sterilization attempts led to higher short-term interest rates at home, attracting more short-term flows, while adding to reserves through sterilization created an illusion of lower liquidity risks in foreign currency terms.¹⁴

Recent experiences with rescue packages also encouraged banks to take excessive risks. For example, during the Swedish banking crisis of 1987–89 the government guaranteed loans to local banks; during the Mexican crisis of 1994–95 the rescue package gave priority to honoring short-term paper in order to prevent default. Such instances have led investors to believe that short-term debt would be honored in future rescue efforts in the event of crisis. Thus lending to local banks—which on-lent to domestic corporates—rose on the belief that these banks had the backing of their governments.

The maturity structure of debt may have been influenced by a differential treatment of short-term debt in the BIS prudential regulations designed to reflect greater risks associated with longer-term debts. According to existing BIS regulations on minimum capital adequacy for banks, short-term lending to non-OECD countries carries a risk weight of 20 percent; loans with maturity of more than one year, by contrast, carry a risk weight of 100 percent; the risk weights do not apply to OECD countries. Thus, reducing the term of an interbank loan to a non-OECD counterparty from thirteen months to twelve months or less would reduce the risk weight from 100 percent to 20 percent. Similarly, short-term, self-liquidating trade-related contingent liabilities arising from the movement of goods carry a smaller risk weighting than comparable commitments

14. World Bank (1999); Calvo and Mendoza (1999); and Montiel and Reinhart (1999).

with original maturity of more than one year.¹⁵ Such differential treatment of short-term debt may have encouraged short-term debt contracts.¹⁶

Empirical Evidence

In this subsection we examine the significance of some of the factors identified above on the maturity structure of borrowing by developing countries from international banks. A number of well-known problems are associated with such an exercise: the cause-and-effect relationships between maturity structure and some of the explanatory variables (such as growth, income levels, and trade) are often difficult to discern; demand and supply factors are both involved; and measures of some of the policy variables (for example, capital account openness or the effects of prudential regulations) are problematic. Therefore, these results need to be treated with caution (see also table 11-4 note, below).

Our analysis (following Rodrik and Velasco [1999]) is based on panel data for thirty-three developing countries that accounted for more than 80 percent of short-term borrowing by developing countries between 1986 and 1998. We regress the share of short-term debt (based on the BIS remaining-maturity concept) in total claims by BIS-reporting banks on these countries against a set of "explanatory" variables: (a) *structural*—the (log of) per capita GNP as a proxy for the level of development and trade openness; (b) *cyclical*—the growth differential between developing countries and the industrial countries, at the U.S. dollar London interbank offered rate (LIBOR); and (c) *institutional and policy factors*—borrowing by domestic banks (reflecting, imperfectly, effects of financial deregulation), capital account restrictions—a variable that takes the value 1 in the presence of restrictions and 0 otherwise (based on IMF [1997]), and a variable for BIS capital adequacy regulations that takes the value 1 during the period 1992–98 (when it became effective), and 0 earlier.

15. See Bank for International Settlements (1997, pp. 67–69). Off-balance sheet engagements are converted to credit risk equivalents by multiplying the nominal principal amounts by a credit conversion factor. For short-term trade-related contingent liabilities, the credit conversion factor is 20 percent. Commitments with original maturity of up to one year or commitments that can be unconditionally cancelled at any time do not have any capital requirement, whereas for those with maturity over one year, the conversion factor is 50 percent. Even the new capital adequacy framework being debated currently does not propose any changes in the existing standards: see Bank for International Settlements (1999).

16. Bank for International Settlements (1999); and Demirgüç-Kunt (1992).

Table 11-4. *Determinants of the Maturity Structure of Debt, 1986-98^a*

<i>Determinants</i>	<i>A^b</i>	<i>B^b</i>
Per capita income (log GNP)	10.439***	10.952***
Trade openness (Trade/GDP, lagged)	0.0905*	0.119**
Borrowing by domestic banks from BIS banks as a share of GDP (reflecting financial deregulation)	0.792***	0.740***
Borrowing by public sector from BIS banks as a share of GDP	-0.270**	-0.281**
Difference between growth rate of each developing country and that of industrial countries as a group	0.281***	n.a.
International interest rates (U.S. dollar LIBOR)		-0.543*
BIS/capital adequacy regulation dummy (1992 - 98 = 1)	1.936*	n.a.
Capital account restrictions dummy	-3.473*	-4.619**
Adjusted <i>R</i> ²	0.31	0.3
Number of observations	413	414

Source: Authors' calculations.

n.a. Not available.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

a. The panel survey includes thirty-three countries—Algeria, Argentina, Bangladesh, Brazil, Bulgaria, Cameroon, Chile, China, Colombia, Ecuador, Egypt, Ghana, Hungary, India, Indonesia, Jordan, South Korea, Malaysia, Mexico, Morocco, Nigeria, Pakistan, Panama, Peru, the Philippines, Poland, Romania, South Africa, Thailand, Tunisia, Turkey, Venezuela, and Zambia.

b. Columns A and B report alternative specifications to account for some collinearity between cyclical variables.

Results are presented in table 11-4. The evidence tends to support the discussions above. Per capita income and trade structural variables appear to account for about half of the increase in short-term borrowing, suggesting the beneficial association of short-term debt with these factors; the other half appears to be accounted for by policy and cyclical factors (approximately 30 percent and 20 percent respectively). Among cyclical variables, faster GDP growth in borrowing countries seems to attract more short-term flows, while a decline in interest rates in industrial countries appears to provide an incentive for short-term lending and borrowing.

Among policy factors, an increase in short-term loans tends to be associated with the growth in interbank lending (reflecting financial deregula-

tion), the opening of capital accounts, and with the effect of BIS regulations. When borrowing by domestic banks is replaced by a more direct financial liberalization indicator (a dummy variable), the results are again positive for seven major countries for which information is available; this is consistent with other findings that financial liberalization shortened the maturity of corporate debt in these countries.¹⁷

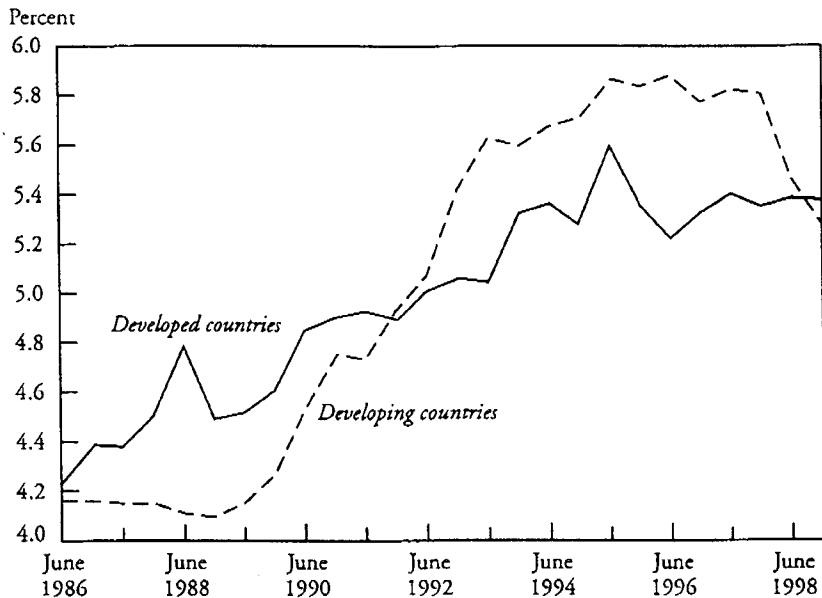
The coefficient of the dummy for the BIS regulation on capital adequacy (which is 1 for 1992–98 and 0 otherwise) is positive and significant, indicating that the BIS regulations may have led to a shortening of debt maturity. A BIS study mentions that pairwise comparisons of lending to equally rated OECD and non-OECD countries indicate a greater concentration of short-term lending to the latter.¹⁸ This is evident at an aggregate level from figure 11-4, which shows a sharp rise in the share of short-term debt in total debt of developing countries since 1990. (The BIS targets were to be achieved by 1992, even though the initiative began in 1988.)

There are three main conclusions to be drawn from these empirical findings: first, the growth of short-term debt indeed accompanied a number of very desirable fundamental factors, such as GDP growth, trade, and FDI. However, it was also associated with some not-so-desirable outcomes, such as excessive lending from domestic banks that fueled unsustainable asset inflation, or circumvention of prudential capital regulations. Second, external push factors were also responsible for high levels of short-term lending to developing countries and raised the risk of capital flow reversal and self-fulfilling liquidity runs in the event of a crisis.

Finally, some of these results point to pro-cyclical behavior of short-term debt in response to adverse shocks. For example, the positive relationship between growth and shortening of debt maturity implies that an adverse shock to growth would lead to a reversal of short-term flows. Thus, instead of smoothing consumption, short-term debt flows would actually accentuate the impact of the shock. This is in line with the findings that short-term debt may not be the trigger for crisis, but that once a crisis happens, it can deepen the impact. The issue of the pro-cyclical response of short-term debt to shocks is explored in greater detail in the next section.

17. Schmukler and Vesperoni (2000).

18. Bank for International Settlements (1999, p. 25).

Figure 11-4. *Short-Term Debt as a Percentage of Total Debt, 1986–98*

Source: Bank for International Settlements.

The Response of Short-Term Capital Flows to Economic Shocks

One important additional reason for why short-term capital flows could play a beneficial role is that in principle such flows could offer relief to countries requiring additional financing in the face of a temporary adverse shock. Such financing could offer residents of the affected country the opportunity to smooth their consumption.

Existing estimates of consumption-smoothing in industrial countries vary widely, from nearly zero percent of lifetime consumption,¹⁹ to a very significant fraction of lifetime consumption²⁰—indicative of the methodological problems in measuring such gains. Nonetheless, when the global capital market allows countries to smooth consumption, one would expect

19. Cole and Obstfeld (1991); Backus, Kehoe, and Kydland (1992); Mendoza (1995); and Tesar (1995).

20. Van Wincoop (1994); and Obstfeld (1995).

the growth path of aggregate consumption to be less volatile than that of aggregate income. Second, one would expect the growth of consumption across countries that are financially integrated to show a much higher correlation than growth of income. These two implications of models of international risk-sharing are, however, rejected in practice, which sheds some doubt on whether financial markets are sufficiently integrated to allow consumption-smoothing through a counter-cyclical response of international capital flows.²¹

From the standpoint of a borrowing country, the benefits of integration arise mainly when short-term debt is counter-cyclical and determined by demand side (pull) factors. However, if lender decisions and other factors make access to short-term capital flows pro-cyclical, a favorable shock may attract huge capital inflows and encourage a level of consumption and investment that is unsustainable over the longer term; or, on the downside, countries may be forced to overadjust to adverse shocks (by reducing imports) when capital flees.²² This is also consistent with findings in the literature that public debt (and fiscal policy) in developing countries, especially in Latin America, tends to be highly pro-cyclical (in sharp contrast to industrial countries) because access to international borrowing is tighter under adverse conditions and less tight under favorable conditions.²³

There are two principal reasons why short-term capital flows respond pro-cyclically to economic shocks: the prevalence of large and frequent economic shocks in developing countries, on the one hand; and information asymmetry problems between lenders and borrowers on the other. Economic shocks tend to be larger and more frequent in developing countries, reflecting their narrower economic bases and greater dependence on primary commodity exports and often resulting in these countries' marginally creditworthy status. Thus changes in risk perception and rating downgrades under adverse shocks can lead to credit-rationing to such marginally creditworthy borrowers; such changes worsen, rather than smooth, their adjustment. These negative effects are exacerbated in the presence of information asymmetry problems between borrowers and lenders, which may cause herding and panic withdrawal of capital in response to an adverse shock.

21. Tamim Bayoumi (1997) studied consumption and growth paths in twenty-one OECD countries and concluded that there was little evidence in support of consumption-smoothing in these countries.

22. See World Bank (1993, p. 21).

23. Easterly, Islam, and Stiglitz (1999).

Jeffrey Sachs argues in the context of the Asian crises that the depletion of reserves, followed by the inevitable devaluation of the currency, revealed to investors holding short-term claims on the domestic financial sector that their investments were more risky than previously expected.²⁴ This in turn created a creditor panic as investors—unwilling to roll over short-term debt—suspended routine interbank lines and refused to continue with standard trade-financing operations.

Sometimes, small events may cause all information that was already in the hands of investors to become included in market prices.²⁵ This may explain why after a shock, investors seemingly all of a sudden withdraw capital from a country, while outsiders may judge this reaction as irrational given the size of the shock and the fact that no new information has arrived in the market. Such potential for agents to learn from the actions of other market participants may be reinforced if fund managers' performance is evaluated relative to that of others: this creates incentives for these managers to mimic the behavior of others if "beating the market" is less valued than being beaten by the market.²⁶

Do short-term capital flows to developing countries, in particular, behave more pro-cyclically than counter-cyclically? Is this behavior exacerbated in the face of different types of shocks? And how do risk-ratings (which influence the quantity and price of capital flows) change in the face of favorable or adverse economic shocks? The evidence in answer to these questions is examined below.

We use a variant of the model described in table 11-4 for this empirical investigation. By expressing the dependent variable as well as the explanatory variables (except dummy variables) as growth rates, the elasticity with respect to a particular variable can be read directly from the estimated coefficients. We estimate this model using the panel data described in the previous section for thirty-three developing countries for the period 1987–98. The results are as follows:

(1) *Short-term debt flows are pro-cyclical to growth in developing countries.* As already anticipated in the results of the previous section, the relationship between growth in short-term debt and growth rates in developing countries is positive and significant in all developing countries. Under-

24. Sachs (1998).

25. See Romer (1994); and Caplin and Leahy (1994).

26. See also Calvo and Mendoza (1999).

Table 11-5. *Elasticity of Short-Term Debt (Original Maturity) with Respect to GDP Growth Rate, 1987-98^a*

Thirty-three countries ^b	3.42
Twenty countries ^c	2.11
Latin America	2.39
East Asia	2.28

Source: Authors' calculations.

a. All reported elasticities are significant at the 1 percent level.

b. See p. 340, table 11-4, note a, for the list of countries.

c. Argentina, Brazil, Chile, China, Colombia, Ecuador, Egypt, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Pakistan, Peru, the Philippines, Poland, South Africa, Thailand, and Venezuela.

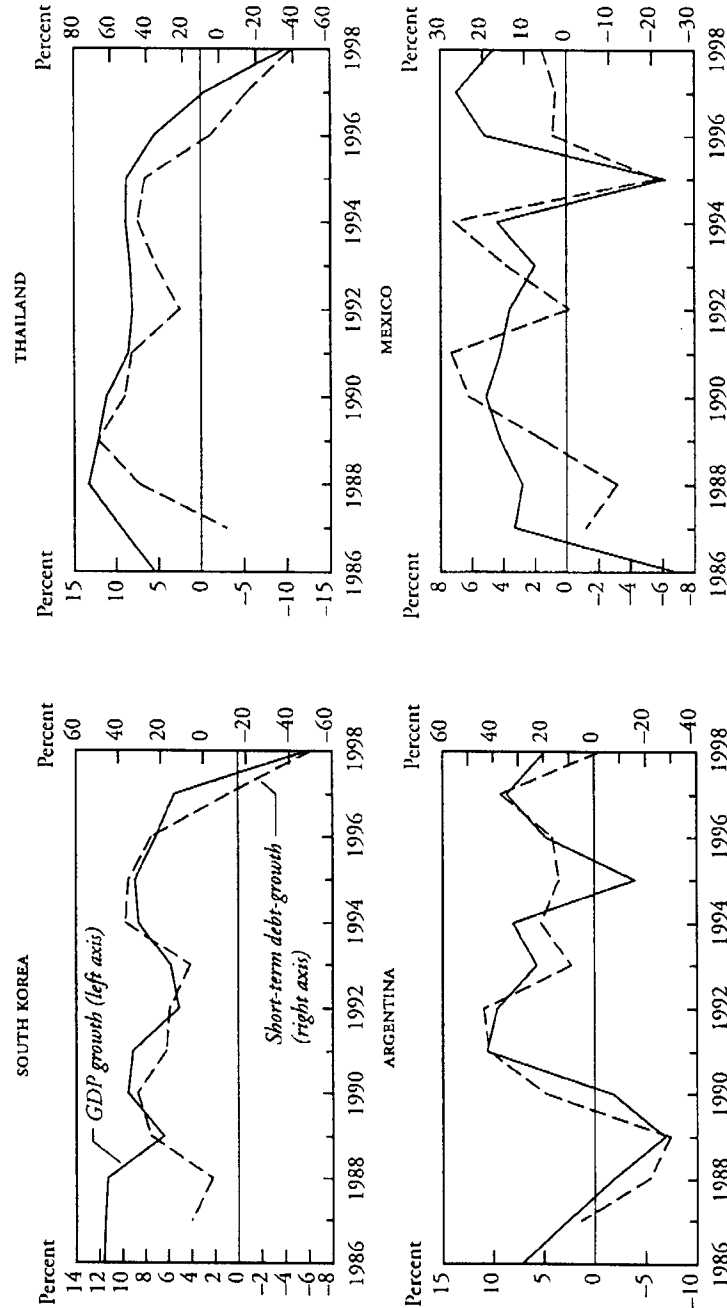
standably this relationship is stronger in some countries than in others (see table 11-5 and figure 11-5).

(2) *Short-term flows are usually more pro-cyclical than medium- and longer-term debt flows.* The finding here is consistent: elasticity of short-term debt with respect to GDP growth rate is 2.1 compared to 0.9 for long-term debt. Thus, short-term debt is more reversible than long-term debt, and the volatility of short-term debt is greater. There is also some evidence that the pro-cyclicality of short-term debt to GDP growth has increased over time, especially in East Asia, where the elasticity of short-term debt with respect to GDP growth is 0.06 during the period 1988–93 and equal to 2.536 during the period 1994–98.

(3) *Short-term flows are pro-cyclical to economic shocks, and pro-cyclicality is greater during adverse shocks.* For the purposes of measuring the behavior of short-term flows during good or bad times, economic shocks are defined as periods of either favorable or adverse outcomes relative to the mean values of the economic variable under consideration. This involves partitioning the sample into good and bad times and then looking at the behavior of short-term debt flows within each partition.²⁷ Two types of economic shocks, in turn, are considered: (a) shocks to GDP

27. Results reported below for all twenty countries relate to the partitions obtained using mean plus or minus one-half standard deviation of the variable concerned. However, the results for specific regions—East Asia and Latin America—relate to a broader partitioning rule using above- or below-mean (to obtain sufficient degrees of freedom). Note that an adverse growth shock defined as mean minus one-half standard deviation may not necessarily imply that growth rate is negative, but it does imply that growth is relatively very low.

Figure 11-5. *Cyclicality of Short-Term Debt*



Source: Bank for International Settlements; World Bank, *Global Economic Prospects* (various issues).

growth; and (b) shocks to the terms of trade that a country faces. The key indicator used is the estimated elasticity of short-term debt with respect to GDP growth rate. We then infer the cyclical response of short-term debt to the different types of shocks from the size and sign of this estimated elasticity during favorable or adverse times, and we investigate the behavior of risk perception by foreign investors (that is, credit ratings) in response to economic shocks.

(a) *Growth shocks.* Short-term debt is highly pro-cyclical, and especially so during adverse growth shocks. When GDP growth experiences a positive shock (one-half standard deviation higher than mean growth rate), the elasticity of short-term debt growth with respect to GDP growth is about 0.9, but in adverse shock (when GDP growth is lower than the mean by one-half standard deviation), short-term debt growth falls twice as fast, with an elasticity of 1.8 in the latter case. By way of contrast, the elasticity of medium- and long-term debt with respect to GDP growth rate is negative (although statistically not significant) for both positive and negative shocks to GDP (at -0.41 and -0.3 respectively), suggesting weak counter-cyclical behavior to shocks to GDP. However, it is difficult to distinguish between demand and supply effects in the pro-cyclical response of short-term debt to growth shocks. Therefore an examination of terms of trade shocks is important, since they tend to be more exogenous.

(b) *Terms of trade shocks.* An analysis of terms of trade shocks reveals a similar pattern of pro-cyclicity as in the case of growth shocks, and greater pro-cyclicity during adverse shocks. The panel data are once again partitioned according to positive and negative terms of trade shocks, which are defined respectively as greater than the mean growth rate plus half the standard deviation of terms of trade growth, and less than the mean minus half the standard deviation. The estimated elasticity of short-term debt with respect to GDP for the partition with positive terms of trade shock is 0.8, compared to 1.8 for the partition with negative terms of trade shock.²⁸ Separating the oil-exporting countries from the others in the panel of twenty countries does not alter this conclusion—the elasticity of short-term debt to growth in either case is higher during below-average growth in terms of trade than during above-average growth—although pro-cyclicity in short-term flows is greater in the non-oil-exporting countries (see table 11-6). This asymmetry in pro-cyclicity between oil-exporting and non-oil-exporting

28. The direct relationship between short-term debt flows and terms of trade indexes is not significant. The relationship seems to operate through the GDP growth variable.

Table 11-6. *Elasticity of Short-Term Debt with Respect to GDP Growth Rate during Periods of Trade Shocks, 1987–98^a*

<i>Country survey</i>	<i>Above-average trade growth</i>	<i>Below-average trade growth</i>
Oil-exporting countries	0.52	3.29*
Non-oil-exporting countries	1.58**	3.62****

Source: Authors' calculations.

**** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

a. Results based on a panel of twenty countries. See p. 345, table 11-5, note c.

developing countries may be explained in terms of the generally better access of the former to international capital markets.

(c) *Responses of risk-ratings to economic shocks.* Finally, there is evidence of a nonlinear relationship between risk perception by creditors and economic shocks in developing countries that lies at the heart of the greater pro-cyclical response of short-term debt to adverse shocks. Perceived risk may increase more during a large adverse shock than it may decline during a small adverse or even positive shock. Table 11-7 presents estimates of the responsiveness of one measure of risk perception, the Institutional Investor Risk Rating, to shocks in GDP growth.

The responsiveness of risk ratings is significantly adverse during times when GDP growth is below the average than it is positive when growth is above average. This is also consistent with other findings (see pp. 353–55) that credit-rating downgrades are associated with high volatility in loan spreads, and that the behavior of credit-rating agencies aggravated the East Asian crisis—by downgrading countries more than would have been justified by fundamentals alone, and thereby raising spreads and reducing access to capital sharply.²⁹ Risk rating goes up (that is, creditworthiness improves) if GDP growth is above the mean, but it falls even more (that is, creditworthiness worsens) when the growth rate dips below the average. This nonlinear response to change in growth rates is more pronounced in East Asia than in Latin America. Although not shown in the table, this relationship has become more important during the period 1993–98 compared to 1986–92.

29. Ferri, Liu, and Stiglitz (1999).

Table 11-7. *Elasticity of Risk Rating with Respect to Shocks in GDP Growth Rate, 1987-98*

<i>Country survey</i>	<i>Above-average GDP growth</i>	<i>Below-average GDP growth</i>
Twenty countries ^a	1.14	1.98***
Latin American countries	0.38	0.99**
East Asian and Pacific countries	1.09**	1.83***

Source: Risk ratings from *Institutional Investor*, various issues; authors' calculations.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

a. For the list of countries, see table 11-5, note c.

Short-Term Debt and Vulnerability to Crises

Short-term flows are potentially the most easily reversible component of private capital flows. Their shorter maturity enables the investor to withdraw quickly, whereas withdrawal of other types of capital can be costly during difficult times. For example, liquidating FDI may involve selling plants and machinery, and selling stocks or bonds during a crisis usually involves a loss for the seller. In contrast, short-term bank loans can be reversed at relatively minimal costs.³⁰ Many countries suffered large reversals in short-term capital flows during the recent financial crises, precipitating severe external liquidity crises. Short-term debt flows to all developing countries from BIS-reporting banks shifted from an inflow of \$43.5 billion in 1997 to an outflow of \$85 billion in 1998 (see table 11-8). Quarterly data suggest an even more dramatic swing.

The reversibility of short-term debt predisposes borrowers to the phenomenon of liquidity runs. The risks of such runs are greater the higher the level of short-term debt relative to the borrowing country's international reserves. Such runs can be self-fulfilling, because the chances of a borrower being repaid declines rapidly once a run has started.³¹ High levels of short-term liabilities involving the financial system also involve risks of bank runs and systemic crisis. Therefore the risk of financial crisis is greater where the

30. Withdrawal of short-term bank lending may involve a setback in the relationship between the bank and its clients, which would impact the bank's business in the future, but the immediate pecuniary cost is relatively small.

31. Furman and Stiglitz (1998); Diamond and Dybvig (1983); Rodrik and Velasco (1998); and Eichengreen and Mody (1999).

Table 11-8. *Short-Term Debt Flows from Developing Countries, 1997 and 1998*

Billion of U.S. dollars

<i>Region or country</i>	<i>1997</i>	<i>1998</i>
All developing countries	43.5	-85.0
East Asia and the Pacific	0.8	-68.0
Indonesia	1.1	-11.8
Malaysia	3.4	-5.3
South Korea	-8.0	-29.9
Thailand	-6.9	-15.1
Latin America and the Caribbean	24.1	-5.7

Source: Bank for International Settlements.

level of short-term debt to reserves is excessive and the banking system is heavily involved in intermediating such flows.³² Since residents may opt to liquidate their short-term assets in the banking system and move them abroad in the event that risks rise, the level of broad money relative to reserves is an additional indicator of vulnerability.

Early studies on crisis prediction did not find any strong evidence that maturity profile of external debt mattered for a crisis.³³ More recently, however, evidence is accumulating to the contrary—both because the influence of liquidity crises has become stronger in recent years and because of greater methodological attention to the subject.³⁴ Steven Radelet and Jeffrey Sachs, for example, find that the ratio of short-term debt to reserves is significantly associated with nine cases of crisis between 1994 and 1997

32. Short-term borrowing by corporations also involves significant risks, but the implications of such risks for systemic crisis are typically less than in the case of banks. The reason is that, unlike a commercial bank, a typical private corporation tends to be small, and its foreign currency liabilities tend to be hedged by export receivables or by real assets. However, unhedged foreign currency borrowings by large corporations may pose more serious risks, as was the case in the recent crises in Asia.

33. For example, Frankel and Rose (1996); Sachs, Tornell, and Velasco (1996a, 1996b, and 1996c); and Kaminsky, Lizondo, and Reinhart (1998).

34. Jason Furman and Joseph Stiglitz (1998) note that, at the end of 1996, eleven of the forty-two developing countries for which data were then available had short-term debt to BIS-reporting banks that exceeded their level of reserves. Several countries from this group subsequently faced severe financial difficulties, including Indonesia (with a ratio of short-term debt to reserves of 1.9), Korea (2.0), Thailand (1.2), South Africa (11.6), Pakistan (5.1), Russia (2.1), Bulgaria (2.1), and Zimbabwe (1.3).

for a sample of nineteen emerging markets.³⁵ Using a larger sample, Rodrik and Velasco find that when the ratio of short-term debt to reserves exceeds 1, there is a 10 percentage point higher probability of crisis than when the ratio is below that level.³⁶ They also find that the probability of crisis increases with total debt, the current account deficit, and real appreciation of the currency, suggesting that both liquidity and fundamentals factors play a role in inducing crises. This conclusion is also supported by Matthieu Bussière and Christian Mulder.³⁷ Their study finds that the ratio of short-term debt to reserves is not only a strong indicator of crises (see table 11-9) but that it is also significantly superior to alternative liquidity-risk specifications such as the ratio of imports to reserves and three different specifications of the ratio of money (M0, M1, and M2) to reserves.³⁸

There are potential trade-offs between liquidity and fundamentals factors (see figure 11-6).³⁹ A safe threshold of short-term debt to reserves appears to be about 1: the crisis index would be zero with that level of short-term debt to reserves, no overvaluation of the currency, and the current account in modest surplus. But countries that have significant current account deficits, some overvaluation of the currency, or both need much larger reserves. Any country whose ratio of short-term debt to reserves significantly exceeds unity appears to be much more vulnerable to the onset of financial crises. These vulnerability windows are particularly important for private-to-private capital flows intermediated by the banking systems of the 1990s.⁴⁰

These findings are robust to an extension of the analysis using a broader definition of the crisis index as a weighted average of the nominal depreciation and loss in reserves (similar to that proposed by Bussière and Mulder⁴¹), as well as an increase in domestic interest rates, weighted by the inverse of the standard deviation of these series. Interest rates are introduced as an added factor, since a rise in domestic interest rates is also closely associated with financial crises. This crisis index is found to be

35. Radelet and Sachs (1998b).

36. Rodrik and Velasco (1999).

37. Bussière and Mulder (1999a, 1999b).

38. It is also the case that a rise in short-term lending before an imminent crisis is partly endogenous to the rising risks of a crisis, so that more fundamental causes of a crisis remain important.

39. Since the probability of crisis is measured for a given year rather than over several years, these regressions may overstate the importance of proximate triggers as opposed to fundamental factors.

40. Bussière and Mulder (1999b).

41. Bussière and Mulder (1999a).

Table 11-9. *Ratios of Short-Term Debt to Reserves*^a

<i>Dependent variable: crisis index</i>	<i>Specification 1 (t statistic)</i>	<i>Specification 2 (t statistic)</i>
Constant	-15.38** (-2.06)	-17.22*** (-2.80)
Real exchange rate index	-0.32* (-1.9)	-0.33* (-1.98)
Current account/GDP	1.65** (2.03)	1.55** (2.05)
Short-term debt/reserves	0.27*** (4.23)	0.28*** (4.75)
Export growth	-0.10 (-0.70)	...
Reserve change	0.00 (0.05)	...
R^2	0.43	0.43
Adjusted R^2	0.36	0.38

Source: Bussière and Mulder (1999a).

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

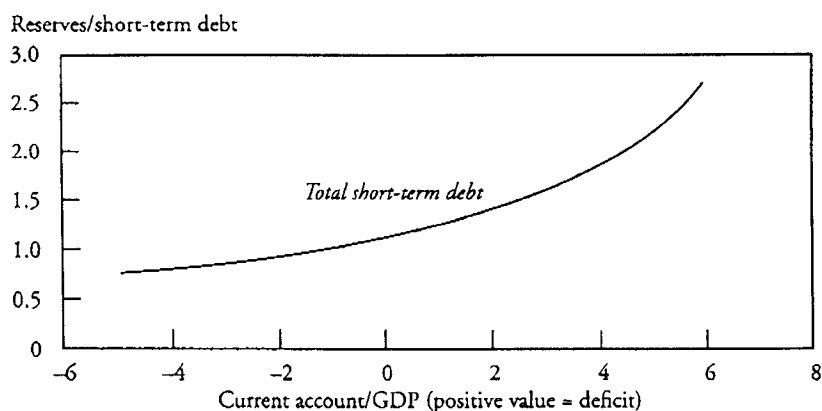
a. The sample includes twenty developing countries for the period 1994–97 (see p. 345, table 11-5, note c). The crisis index is defined as the weighted average of a loss in reserves and exchange rate depreciation; *t* statistics are in parentheses.

strongly associated with the ratio of short-term bank debt (under the BIS definition) to reserves (note the case of Thailand in the third quarter of 1997 and of Mexico at the beginning of 1995 in figure 11-7). The qualitative results remain unchanged for a larger number of countries, including both developing and developed countries.

Conclusion

To summarize the findings of the above discussion relating to the growth and determinants of short-term borrowing by developing countries from international banks and the behavior of such debt during economic shocks:

—Short-term borrowing by developing countries from international banks nearly tripled between 1990 and 1997, with especially rapid growth in East Asia and Latin America.

Figure 11-6. *Trade-Off between Liquidity and Fundamentals^a*

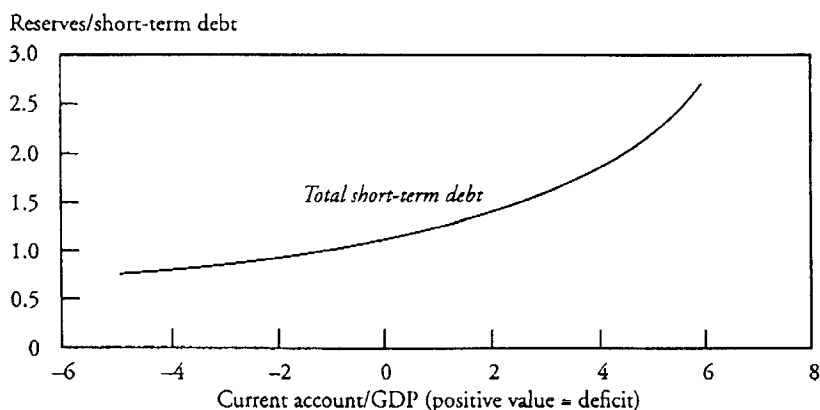
Source: Bussière and Mulder, 1999b.

a. The figure shows the equilibrium relationship between the ratio of reserves to short-term debt and current account deficit as a share of GDP when the crisis index is 0 and the real exchange rate is not overvalued.

—Some of this rapid rise was associated with significant benefits: it helped finance growing trade and supported faster economic growth. However, policy-induced distortions also contributed to the boom in short-term borrowing. These distortions stemmed from the rapid liberalization of domestic banking systems and the opening of capital accounts in borrowing countries without adequate supervision and risk-management practices in place, from the sterilization of capital inflows seeking to defend pegged exchange rates, and from international capital adequacy regulations that favored short-term lending. Cyclical influences, such as lower interest rates in industrial countries and asset market booms in borrowing countries, also stimulated growth in short-term borrowing.

—Short-term lending to developing countries tends to be pro-cyclical, rising during favorable times and falling even more sharply following adverse shocks. As a result, such lending often amplifies booms and busts rather than helping to smooth consumption. Such cyclical behavior of short-term flows may be due to asymmetric changes in risk perception in response to favorable and unfavorable economic shocks.

—Short-term debt in excess of short-term liquidity (as measured by holdings of foreign reserves) increases developing countries' vulnerability to financial crises. The risk of crises also appears to rise with the share of

Figure 11-6. *Trade-Off between Liquidity and Fundamentals^a*

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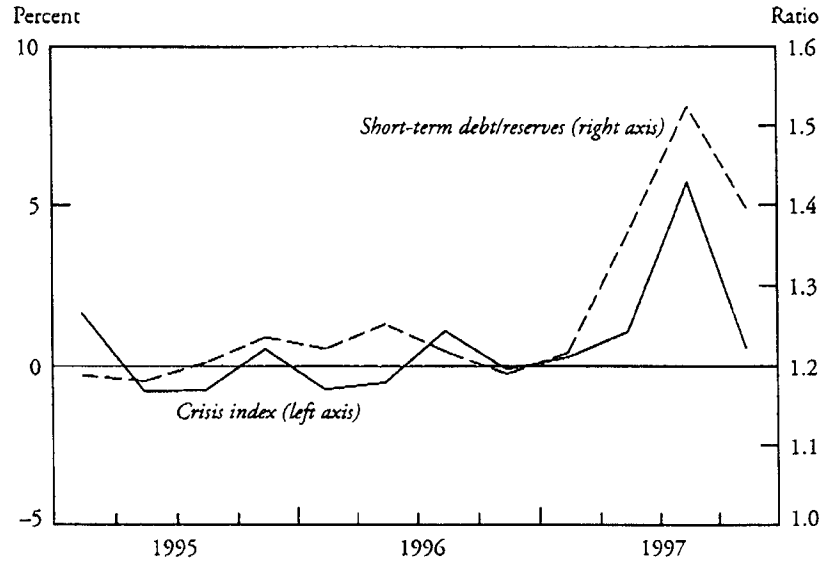
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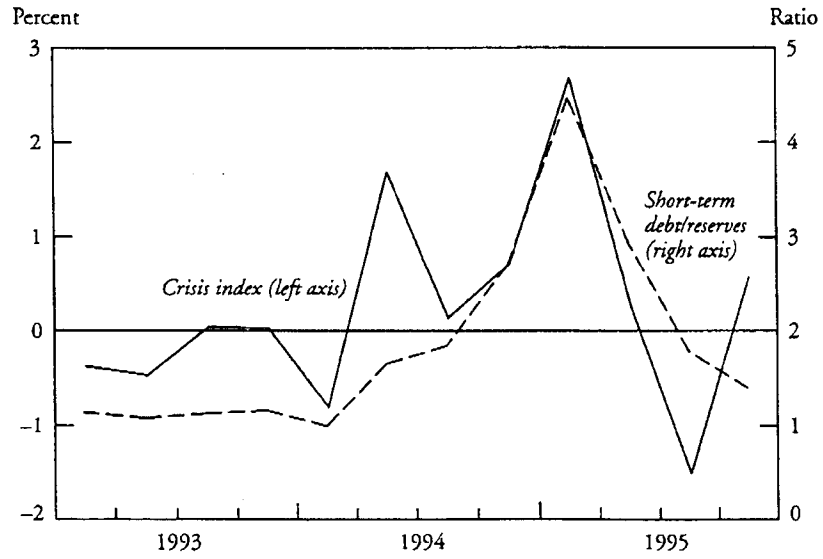
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Figure 11-7. *Liquidity Ratios and the Crisis Index, Thailand and Mexico*

THAILAND, 1995-97



MEXICO, 1993-95



Source: Authors' calculations.

short-term borrowing by domestic banks. The interaction of deteriorating fundamentals (such as overvalued currencies and excessive public borrowing) and high levels of short-term debt appears to have played a significant role in recent crises. For countries with open capital accounts and high levels of financial intermediation, the level of broad money relative to international reserves is also important, because of the potential for domestic capital flight.

Given these risks, close monitoring and effective management of short-term debt (in particular, of short-term debt intermediated by domestic banks) are essential in developing countries in order to avoid currency and liquidity crises. This is not an easy task, however, considering that existing reporting systems fail to capture a significant part of potentially reversible short-term components of capital flows.⁴² We provide a brief discussion of the data reporting systems in the appendix.

Although our discussion has focused exclusively on short-term debt, this is not the only reversible form of capital flows. Arguably almost all types of foreign investment can be withdrawn at a cost, and such costs have fallen rapidly as financial instruments and investment contracts have become increasingly complex in recent times. For example, our preliminary calculations on bond issuance show that the value of bonds with put options—which allows a long-term bond to be sold before the maturity date—has been significantly higher than that of short-term bonds in the 1990s.

Also to be borne in mind is that fact that most of the developing countries are only marginally creditworthy, and the only form of capital available to these countries is short-term debt from banks. Therefore, the only course of action for these countries may be to avoid policies that risk distorting the maturity pattern of debt flows toward the short end. This applies for industrial countries and international prudential regulations as well.

Appendix 11A Shortcomings in the Reporting of Short-Term Debt

Given the large risks that developing countries run when borrowing short-term, improvements are needed in the reporting systems for short-term

42. The Inter-Agency Task Force on Finance Statistics (with participation by the BIS, the IMF, the OECD, and the World Bank) has recently been established to improve the quality, frequency, and coverage of debt information.

debt flows. Incomplete and partial information can provide a false sense of security. The three main debt reporting systems—operated by the BIS, the OECD, and the World Bank—report the short-term debt positions of developing countries. The BIS collects information on the international positions of banks in the reporting areas from the national banking authorities in eighteen major industrial countries plus six offshore centers⁴³ that report their claims on a worldwide consolidated basis. The creditor reporting system of the OECD provides semi-annual data on official and officially guaranteed non-bank export credits from twenty-one OECD member countries aggregated at the borrowing-country level. The World Bank uses this information on export to obtain its own estimates of short-term debt outstanding for some countries. The World Bank debtor reporting system obtains debt information from 129 debtor countries; this information is published annually in *Global Development Finance* and relies heavily on BIS and OECD information.

However, existing reporting systems may significantly understate the true extent of reversible short-term liabilities. Existing information systems rely primarily on BIS banking statistics and do not adequately capture short-term flows outside the banking sector. Significant omissions include investments in developing-country assets by international mutual funds, and non-BIS banks, cross-border deposits held by nonresidents, and inter-firm cross-border flows. Off-balance-sheet exposures are also omitted from the BIS definition, which may be especially significant with the rapid growth of derivatives transactions in developing countries in foreign exchange and interest rates.

During the Mexican peso crisis of 1994, swap and forward contracts on tesobonos (short-term local-currency bonds) increased by 40 percent before the end of 1994, at which point Mexican institutions held some \$16 billion in swaps.⁴⁴ Similarly, before the Russian debt moratorium, both foreign and domestic creditors traded in over-the-counter derivatives amounting to perhaps as much as \$90 billion. And U.S. data for nine East Asian countries suggest that, as of June 1997, before the onset of the crisis, in that region off-balance-sheet claims represented some 9 percent of total

43. Industrialized reporting countries are: Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom, and the United States. Other banking centers are the Bahamas, Bahrain, the Cayman Islands, Hong Kong, the Netherlands Antilles, and Singapore. These offshore banking centers are not covered in the semiannual or consolidated series.

44. Nussbaum (1997).

U.S. bank claims. They had risen to 28 percent of total claims by December 1997, clearly illustrating the importance that such transactions can have in crisis countries.⁴⁵ In addition to these factors, a serious challenge to estimating the potentially reversible component of capital arises from the use of put options in debt contracts, which allows investors to reduce or recall loans prior to maturity.

A second shortcoming is that the current system does not provide information on the nonresident holders of short-term liabilities owed by the private sector and in particular, by the domestic banks. Without such information, national authorities have no way of forestalling potentially excessive growth of such cross-border liabilities. Consequently, improvements in national debt-reporting systems, especially with regard to short-term liabilities of the national banking system, are equally important. But the role of hedge funds, offshore financial centers, and cross-border derivatives transactions will limit the extent to which national authorities can fully measure short-term liabilities.

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