

III Behavior of Nominal and Real Interest Rates

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The ultimate objective for interest rates in IMF-supported programs is to contribute to the allocation of savings according to competitive market principles, free of distortions or market failures. In this ideal situation real interest rates would normally be positive at moderate levels and reflective of underlying market forces such as the return on investments and the marginal utility of deferred consumption. Over short periods, of course, even market-determined interest rates may deviate from these benchmarks because the authorities may have to react to transient pressures in international or domestic capital markets by tightening credit. Moreover, high or time-varying risk premia—not uncommon in countries undertaking adjustment programs—can also cause a departure from these norms.

The beneficial effects of market-determined interest rates reflecting the characteristics noted above are not always easy to discern. The weak link between the behavior of total private saving and real interest rates is well known from the literature (McKinnon (1988)) and is confirmed in the paper on developments in private saving in this volume. Where there is evidence of a more systematic role for interest rates is in influencing the efficiency of investment (IMF (1983), Fry (1988), Gelb (1989), Galbis (1993)). To the extent that interest rates are administratively held below market-determined levels, nonprice rationing of loanable funds must occur. In these circumstances, banking systems are a vehicle for redistributing financial resources more according to government dictates than to the creditworthiness of borrowers or efficiency considerations. Thus, several studies have found a negative correlation between the degree of financial market repression and the rate of economic growth.

While a financial environment in which stable and moderately positive real interest rates prevail may be the ideal, designing policies toward this end is not straightforward. The real interest rate is not itself a policy control variable, but rather the outcome of policies (except in financial systems that are fully indexed, as in Brazil). In fact, for many of the 36 countries under review, which had moved or were

moving toward a significant role for markets in determining interest rates, even nominal interest rates were not fully subject to policy control. Seen in this light, the term “interest rate policy” suggests more control than actually exists. Moreover, in the view of some, the targeting of nominal interest rates is either impossible or undesirable (Friedman (1968), Brunner (1989)), in part because of the indeterminacy of the price level that can result from such targets (Sargent and Wallace (1975) and McCallum (1990)). Others have argued, however, that such indeterminacy will not normally result from interest rate targeting, which is actually preferable to monetary targeting (Barro (1989)). But whatever the theoretical standpoint, interest rates are indisputedly focal prices in the economy, and countries conducted financial policies with a close eye to their effects on both nominal and real interest rates.

The purpose of this study is to review developments in interest rates in IMF-supported programs, to assess the degree to which the basic objectives for interest rates were met, and to understand the reasons for divergences from them. A number of general themes emerge. First, there was considerable success in eliminating negative real interest rates during programs. Second, the key to this success was usually the introduction of market forces to the determination of interest rates. Third, the freeing of interest rates did not come without a cost: spreads between deposit and lending rates often widened. Fourth, the move to positive real rates often entailed real interest rates rising to levels that were considered by the authorities to be “excessive.” While very high real interest rates can be a symptom of fundamental problems in the financial sector, in the countries reviewed they tended to be temporary except when levels of government borrowing were clearly excessive.

While recognizing that a number of different interest rates exist in each country, this study has used a “representative rate” for each country. There are a variety of different approaches to the measurement of real interest rates, ranging from forward-looking or “rational expectations” models to backward-looking, “adaptive expectations” models. The

Table 3-1. Decontrol of Interest Rates and Introduction of Auctions, 1986–92

(Number of countries)

| | Before Programs Reviewed | During Programs Reviewed | After Programs Reviewed | Not Completed by 1992 | Completed by 1992 |
|--|--------------------------------|--------------------------------|-------------------------------|-----------------------------|----------------------|
| Advanced reformers (24)¹ | | | | | |
| Freed interest rates | 9 | 11 | 4 | — | 24 |
| Introduced auctions | 5 | 17 | 2 | — | 24 |
| Both | 5 | 14 | 5 | — | 24 |
| Slow reformers (12)² | | | | | |
| Freed interest rates | 1 | 2 | — | 9 | 3 |
| Introduced auctions | — | 2 | 1 | 9 | 3 |
| Both | — | — | — | 12 | — |

Source: IMF staff estimates.

¹Argentina, Brazil, Bulgaria, Costa Rica, Czechoslovakia, Ecuador, Egypt, El Salvador, Guatemala, Guyana, Honduras, Hungary, Jamaica, Mexico, Morocco, Nigeria, Papua New Guinea, the Philippines, Poland, Romania, Trinidad and Tobago, Tunisia, Uruguay, and Venezuela.²Algeria, Cameroon, the Congo, Côte d'Ivoire, Gabon, Haiti, Jordan, Madagascar, Mali, Pakistan, Yugoslavia, and Zaïre.

approach followed here, with certain exceptions, has been to employ a compromise, part forward-looking, part backward-looking formula: results appear to be robust to some degree of variation in the weight given to forward- and backward-looking components.¹

The focus of this study is on the policies affecting real interest rates and the process of guiding interest rates toward moderate and sustainable levels. The study does not consider the evidence with regard to the effects of interest rate policies on other economic variables such as investment, saving, and output, although these are important issues for further analysis.

Overview of Developments During IMF Arrangements

Overall, there was a definite trend toward positive real interest rates during the period of IMF involvement in the 36 countries under review. Whereas only 36 percent of these countries had positive real interest rates before the programs reviewed, this por-

portion rose to 44 percent during the programs and to 55 percent by 1992. Success in attaining “stable and moderately positive” real interest rates, however, was less impressive—many countries at some point experienced real rates that were very high.

Market Forces Take Over

In many respects, the period under review can be seen as a golden age of interest rate reform. Many countries started the period with regulated systems in which market influences were limited but ended with significantly more liberal financial sectors. Two of the most important elements of this process were the decontrol of bank interest rates, which gave banks the freedom to reflect market influences, and the introduction of market forces—usually by means of auctions—to the pricing of government paper, which heightened competition for banks.² While the majority of countries began their arrangements with direct controls on bank interest rates, many controls were abolished either during the programs under review or soon thereafter, sometimes during a subsequent arrangement (Table 3-1 and Appendix Table 3-A2). Also, almost two thirds of countries introduced auctions or similar systems for short-term government or central bank bills. To examine the effects of these changes, the countries under review are grouped as *advanced reformers* (countries where

¹This study focuses on monthly observations of representative nominal interest rates for each country—short term and market determined where applicable. Usually these lie between retail deposit and lending rates. Real interest rates employ a centered one-year moving average of consumer price inflation, except for Central Europe, where a three-month forward inflation rate is used, and Argentina, Brazil, and Uruguay, where the inflation rate is the ex post rate consistent with the maturity of the interest rate. This difference reflects the view that inertial effects are likely to be considerably shorter when inflation is high and variable. For definitions see Appendix Table 3-A1.

²Another potentially important influence on nominal and real interest rates is changes in tax policies that modify after-tax returns on savings and investment. In general, such changes were not large in the countries reviewed, although they could have been an influence in a few.

Table 3-2. Real Interest Rates and Inflation in the Year Preceding Programs*(Number of countries)*

| | Inflation (Percent a year) | | | |
|---|-------------------------------|-------|-------|---------|
| | Below 10 | 10–20 | 20–50 | Over 50 |
| Countries with negative real interest rates | — | 8 | 7 | 8 |
| Countries with positive real interest rates | 11 | — | 1 | 1 |

Sources: IMF, *International Financial Statistics*, various issues; and staff estimates.

controls on interest rates were significantly reduced and auctions were introduced before or during the programs reviewed) and *slow reformers* (countries where neither or only one of these reforms occurred).

Developments in Interest Rates

To assess the general level of real interest rates, interest rates were considered from the vantage point of a consumer, before tax, with wholesale funds for placement in either the banking system or treasury bills. In general, the relevant “reference” rate employed was above retail deposit rates but below lending rates. Whether the ideal of a moderately positive real reference rate also implies an appropriate rate for borrowers depends on both the spreads and the relationship between product (wholesale) prices and consumer prices.

About two thirds of the countries under review had negative real (reference) interest rates, ranging from –84 percent a year (Poland) to –2 percent (Egypt) in the year preceding their first arrangement (Table 3-2). Ten countries had real interest rates below –25 percent a year. In general, negative real interest rates reflected repression resulting from administrative controls, often in situations of large-scale monetary financing of government deficits and, therefore, high inflation. Countries with positive real interest rates were more likely to have lower rates of inflation, unless they had indexation schemes in place.

Programs in most of these countries sought a rise in real interest rates to positive levels early in the adjustment process. The principal exceptions were the three Central European countries (Bulgaria, Czechoslovakia, and Romania) that entered their programs with large monetary overhangs or ongoing price liberalizations. For these, there was an implicit recog-

nition that eliminating the overhang would require a short period—some three to four months—of negative real interest rates to help effect the required transfer from depositors to debtors. Once this process was completed, it was expected that real interest rates would become positive. In fact, except in Poland in 1990, when real interest rates were very high, this goal proved difficult to attain despite most countries having undertaken major financial sector reforms by 1992. Except for short time spans, real reference interest rates were highly negative throughout the period in Bulgaria, Romania, and Yugoslavia and were around zero in 1992 in the other countries (Appendix Table 3-A3). In this context, wide spreads suggest that real deposit rates were negative but that real bank lending rates were considerably higher. With wholesale (product) prices rising more slowly than consumer prices in Poland (1991–92), Hungary (1992), and Bulgaria (1991–92), real borrowing costs measured in terms of product prices were often positive and sometimes quite high in the years concerned.³

For most of the 17 countries outside Central Europe that started with negative real interest rates, the critical element in significantly raising real rates was financial sector reform. Since controls were typically geared toward holding down costs of financing the budget or state enterprises, liberalizing financial markets tended to result in higher interest rates.⁴ Of these 17 countries, 11 had undertaken key reforms either shortly before their programs or by 1992. Ten of these countries—all but Honduras—saw signifi-

³In Poland in 1990 real borrowing costs were positive even measured in terms of consumer prices. In some countries, the low increases in producer relative to consumer price indices reflect the rising relative price of retail services not captured in the producer price index.

⁴Giovannini and de Melo (1993) discuss the motivation for financial repression in terms of government finances.

cant increases in real interest rates, although only three achieved positive real interest rates during their programs (see Table 3-A4). With further measures and additional time to strengthen market forces, however, all but four had positive real rates by 1992.⁵ In fact, in a few countries interest rates rose to levels that caused concern about whether they had become too high. Initially, increases in real interest rates stemmed predominantly from rising nominal rates, but subsequently falling inflation was more important. In most countries, the rise in nominal rates occurred following liberalization, but in a few the initial rise in nominal rates resulted from administered adjustments prior to reform.

In the other six countries outside Central Europe that started with negative real interest rates (Appendix Table 3-A5), financial sector reforms were slower. By the end of the arrangements under review, each still retained controls on interest rates or lacked auctions or related systems for selling treasury bills and conducting open market operations. Of these six countries only Madagascar had positive real interest rates on average during the programs reviewed.

Thirteen countries began the programs under review with positive real interest rates (Appendix Tables 3-A6 and 3-A7)—six in excess of 6 percent a year, well above those typically observed in industrial countries and higher than the countries' own recent growth rates.⁶ There was less uniformity in the approach to high real interest rates than to market repression. This reflected uncertainty about what constituted an excessive level of real interest rates, as well as difficulties in addressing high interest rates without sacrificing other objectives, such as containing inflation, defending a fixed exchange rate, or improving the external position.

Most countries that started with positive real interest rates had a combination of administered interest rates and relatively low inflation rates. (In all except two, the rate of inflation was below 10 percent in the year prior to their arrangements.) Thus financial sector reform was still an important issue for the efficiency of the financial system in general. In fact, in the eight countries that vigorously pursued financial reforms, most saw a decline in real rates during programs. Only in a few countries, however, did this de-

cline result in real rates turning negative. Generally, countries that started with positive real interest rates kept them. In the slower reformers that started with positive real interest rates (all in the CFA), real interest rates tended to stay high or even rise, mainly reflecting the increase in interest rates in France.

Developments in Spreads

Spreads—the difference between banks' loan and deposit rates—are influenced by three main factors: the degree of market power of banks, the efficiency of banks (their operating costs per unit of deposits), and the ratio of unremunerated required reserves. The market power of banks, in circumstances where the banking system was usually oligopolistic, was traditionally curtailed in many of the countries under review by controls on interest rates and spreads. When these controls were removed, spreads tended to widen. The willingness of banks to utilize their market power was often related to the need to recapitalize and provide for loan losses. This need was smaller when banks were adequately capitalized prior to liberalizing interest rates. The ability of banks to exercise market power following liberalization depended in part on competition from foreign banks. Spreads can also be influenced by remunerated reserve requirements, provided that the rate of remuneration is below market interest rates. While spreads can be narrowed by cutting reserve requirements with below-market or zero remuneration, this is not without fiscal cost to the central bank.

The measurement of spreads is problematic, because published deposit and, especially, "base" or "prime" rates do not always correspond to the actual rates paid or charged to customers. While cross-country comparisons in terms of levels are therefore precarious, the evolution over time of any given measure may still reveal trends in the efficiency and competitiveness of the banking system. (See Appendix Table 3-A8 for the definition of spreads employed in this study.)

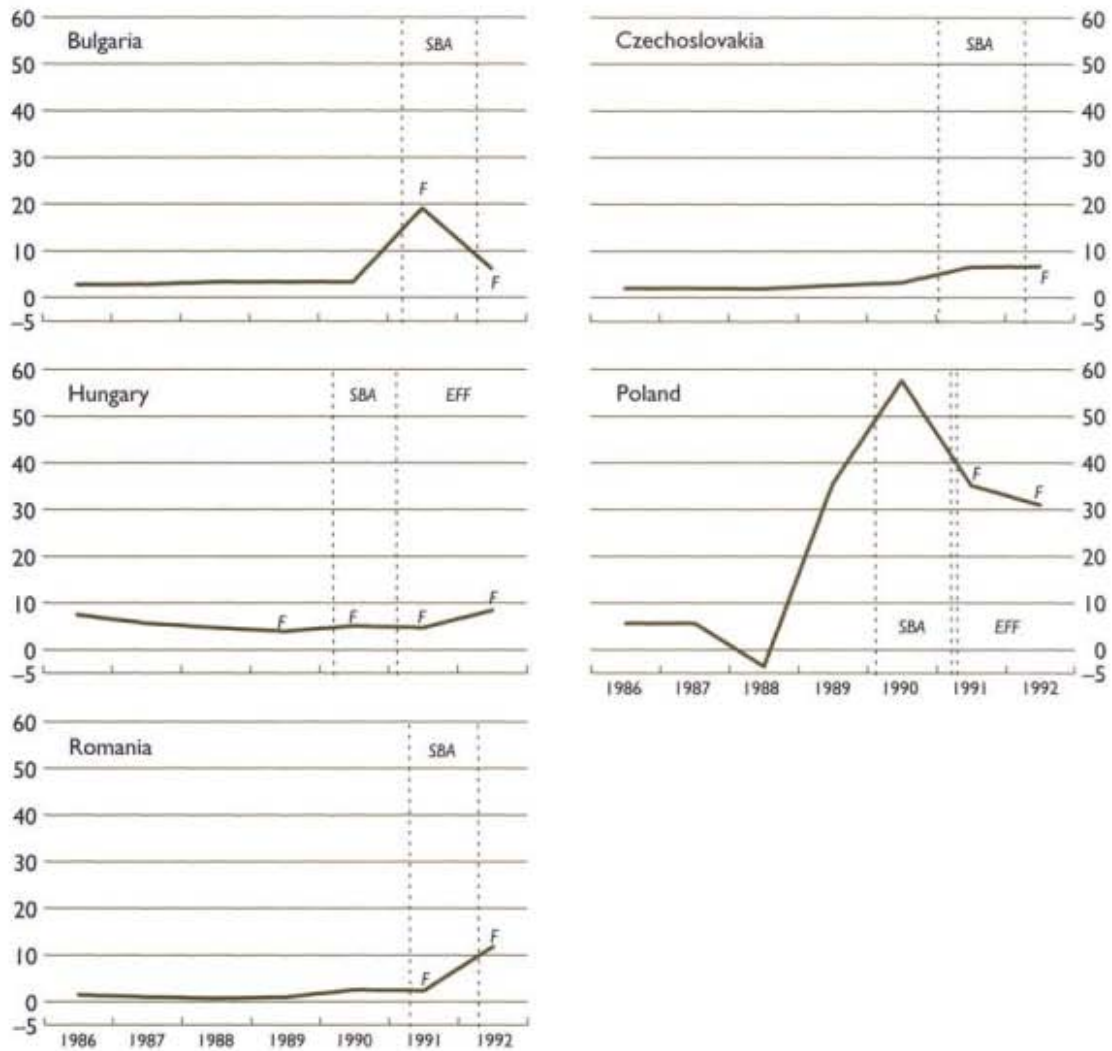
Notwithstanding these measurement difficulties, the evidence suggests that there was a general increase in banking sector spreads during 1986–92; increases were strongly correlated with the freeing of interest rates in the banking system (Charts 3-1 to 3-3). Of the 24 countries where interest rates were free by the end of 1992 and for which data on spreads exist, all but Egypt, Morocco, Tunisia, and the Philippines experienced widening spreads over this period. Spreads were particularly high in Uruguay—where interest rates were free throughout the period—and rose even higher during the period. This reflected a combination of very high reserve ratios (up to 40 percent), high operating costs (the two largest banks are publicly owned), and delinquent

⁵For countries outside Central Europe, consumer and wholesale prices tended, on average, to move together between 1986 and 1989. Between 1990 and 1992 there was a slight tendency for wholesale prices to rise more slowly. The finding that real interest rates were generally negative prior to arrangements but positive by 1992 would therefore be reinforced by the use of wholesale rather than consumer price indices to calculate real interest rates.

⁶There are no clear criteria for determining the level at which real interest rates might be seen as excessive, although interest rates in industrial countries or countries' own growth rates are two possible standards; this issue is discussed below.

Chart 3-1. Central Europe: Spreads Between Deposit and Lending Rates¹

(Annual average; percent a year)



Sources: IMF, *International Financial Statistics*, various issues; and staff documents.

Note: SBA = stand-by arrangement; EFF = extended Fund facility; F = freedom of commercial bank loan and deposit rates.

¹Difference between lending and deposit rates, in percent a year.

loans. The most dramatic increases in spreads occurred in Central Europe during the initial stage of reforms. In Poland and Bulgaria spreads, which reached their peak in 1990–91, subsequently declined, although in Poland they remain well above those of most of the other countries under review. Spreads sometimes increased in the slow reformers too, but usually by smaller margins—except in countries that freed interest rates in the banking sys-

tem (Jordan and Haiti) during the period reviewed. Where spreads did not increase, reserve requirements were reduced (on domestic currency deposits in Egypt), limits on spreads were retained despite the freeing of rates (Morocco, Tunisia), or interest rates had been liberalized for some time (Philippines).⁷

⁷A contributory factor to the lowering of spreads in Egypt was the recapitalization of four large public sector banks in 1991.

Chart 3-2. Advanced Reformers: Spreads Between Deposit and Lending Rates¹

(Annual average; percent a year)

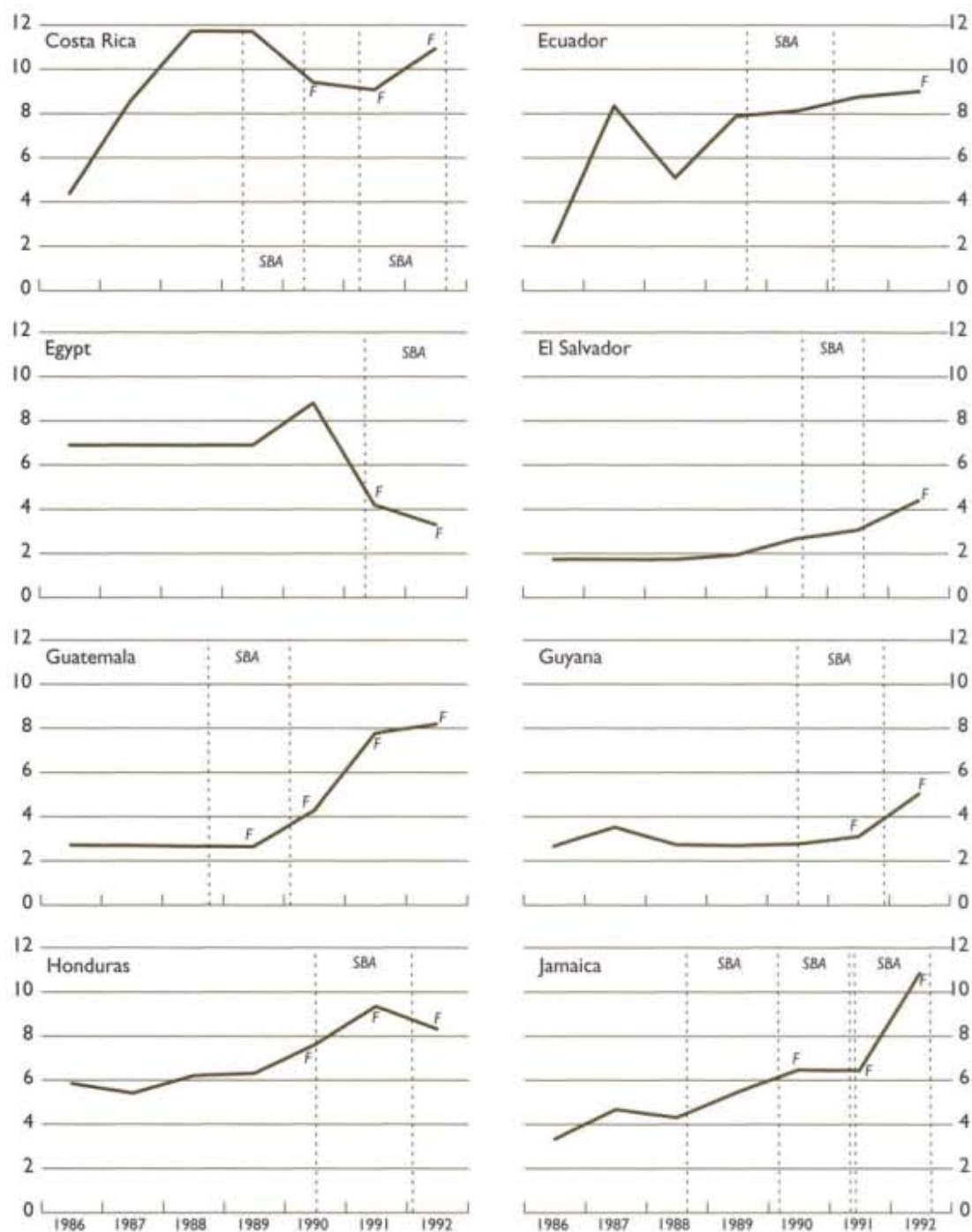
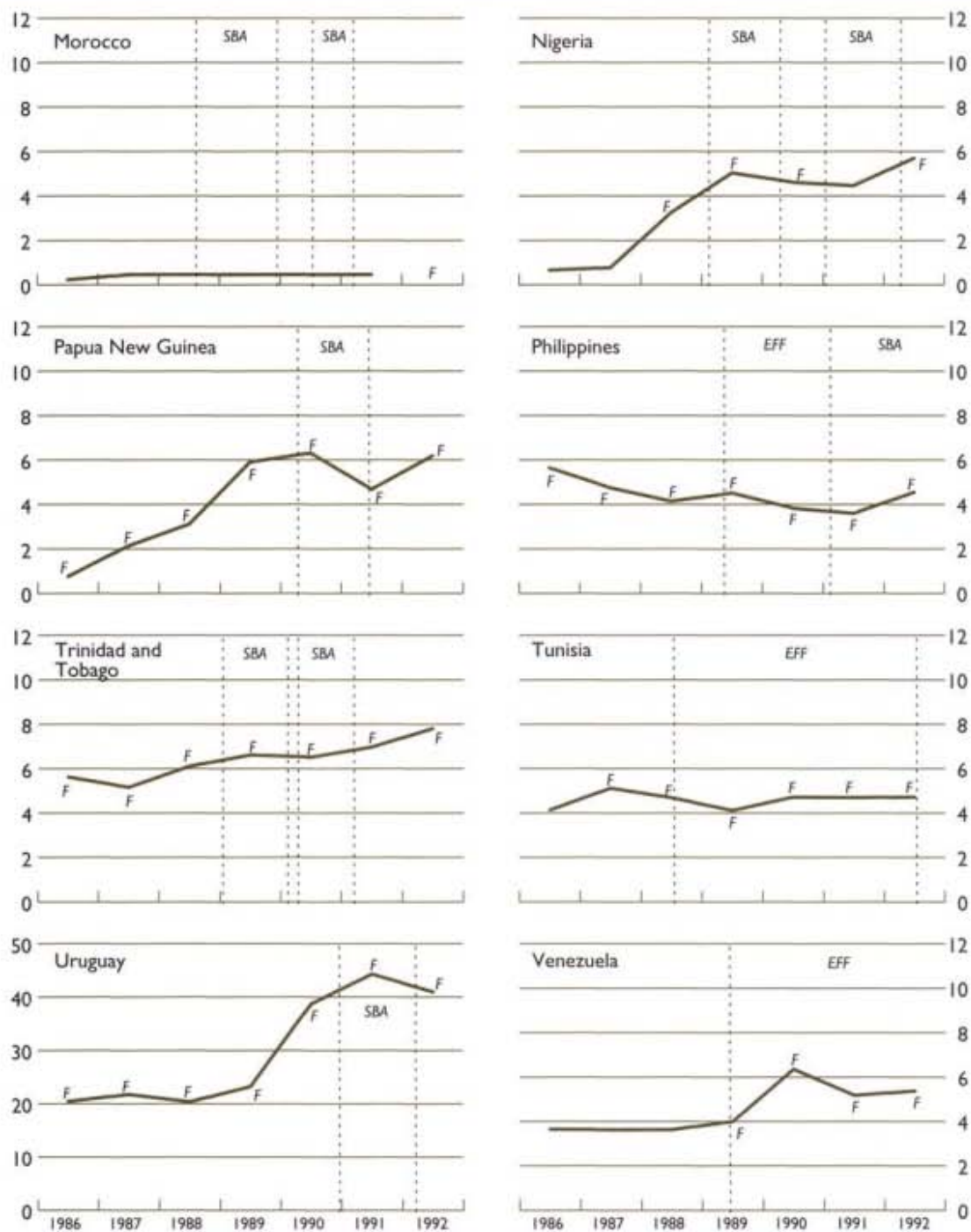


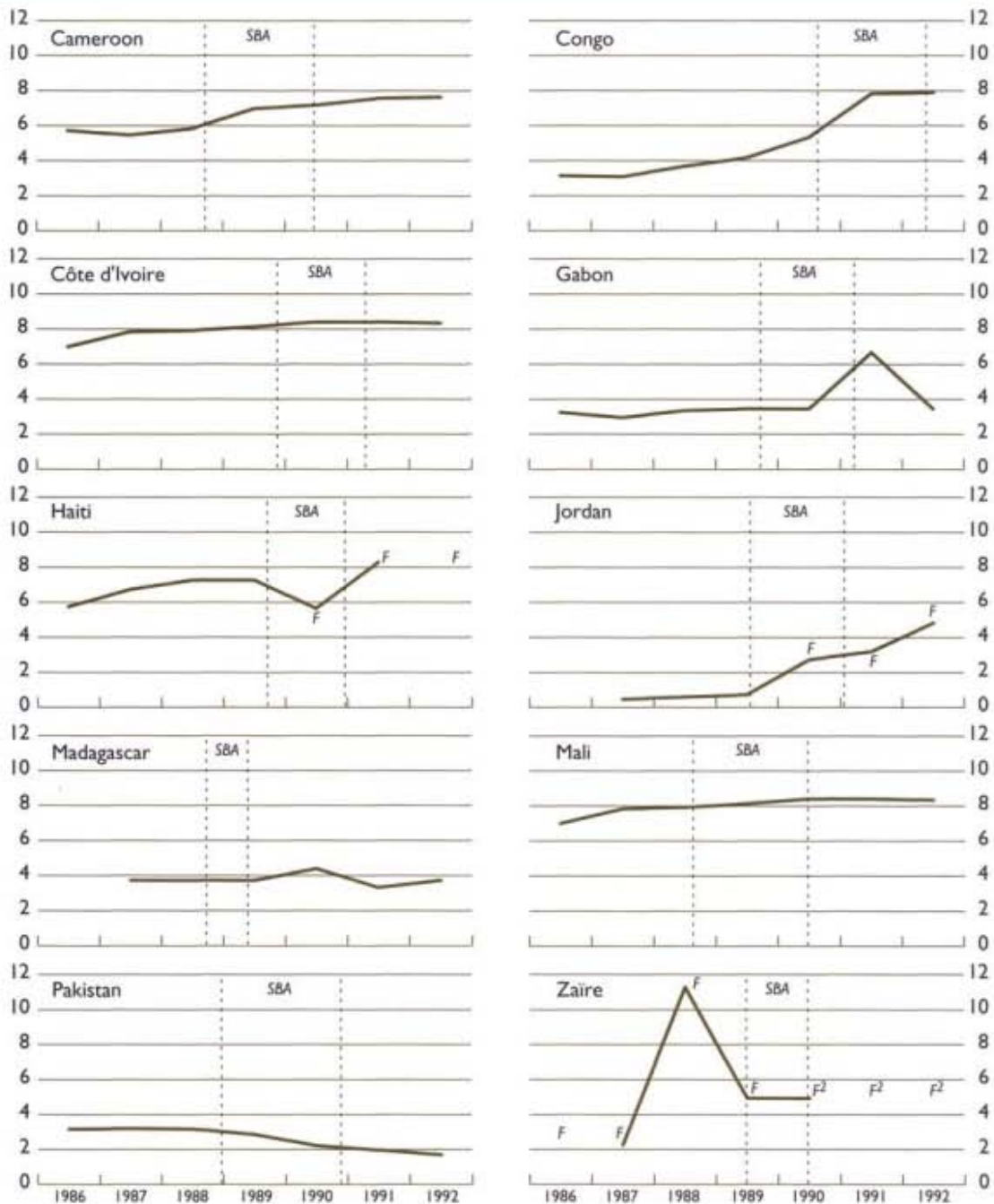
Chart 3-2 (concluded)



Sources: IMF, *International Financial Statistics*, various issues; and staff documents.

Note: SBA = stand-by arrangement; EFF = extended Fund facility; F = freedom of commercial bank loan and deposit rates.

¹ Difference between lending and deposit rates, in percent a year.

Chart 3-3. Slow Reformers: Spreads Between Deposit and Lending Rate¹*(Annual averages; percent a year)*Sources: IMF, *International Financial Statistics*, various issues; and staff documents.

Note: SBA = stand-by arrangement; EFF = extended Fund facility; F = freedom of commercial bank loan and deposit rates.

¹Difference between lending and deposit rates, in percent a year.²Data unavailable.

How Real Interest Rates Were Raised

For countries that had negative real interest rates at the start of their programs, the primary factor holding down real interest rates was administrative controls—in the context of excessive credit growth—which both directly capped nominal interest rates below the rate of inflation and prevented international movements of capital. Thus, addressing a problem of negative real interest rates typically involved either introducing market forces into interest rate determination, curtailing credit creation or, more commonly, both.⁸ Introducing treasury bill auctions also allowed nonbanks, where they could participate, to contribute directly to financing the deficit. This both raised the returns that wholesale funds could earn and, by introducing competition to banks, put upward pressure on their interest rates as well. This process was complicated by the presence of losses in the banking system. Depending on whether loss-making banks were bailed out, such losses could make positive real interest rates either elusive on the deposit side or quite high on the lending side.

Role of Liberalization

For the 17 countries outside Central Europe that began their programs with negative real interest rates, the record of achieving positive real interest rates or a significant move toward this goal in large part reflected progress with financial sector liberalization. Almost half of these countries (Costa Rica, Ecuador, Egypt, El Salvador, Guyana, Honduras, Nigeria, and Venezuela) removed controls on a significant range of basic interest rates and introduced auctions for government paper either immediately before or during the period under review.⁹ Each of

these eight countries (together with Argentina and Trinidad and Tobago, which had liberalized prior to the programs under review) saw a shift to positive real interest rates either during or soon after the programs. For most of these countries, an important element in the increase in real interest rates was rising nominal rates, although lower inflation also played a role.

In the seven countries that started with negative real interest rates but did not liberalize significantly, real interest rates tended to remain at low or negative levels or fall. Most of these countries had partially liberalized by either decontrolling nominal interest rates (Jordan and Zaïre) or introducing auctions (Madagascar, Pakistan, and Brazil, where real interest rates were controlled through an indexing scheme). The partial nature of these reforms, however, clearly did not impart sufficient flexibility to nominal rates to bring about positive real interest rates unless, as in Jordan, inflation fell. In Zaïre, where interest rates were officially decontrolled but there was no competition from auctions and a degree of moral suasion still prevailed, interest rates in the banking system were not sufficiently flexible to keep up with accelerating inflation. On the other hand, in Madagascar and Pakistan, where auctions were introduced without freeing interest rates, interest rates on treasury bills became positive in real terms, but they were not transmitted through the banking system. (In Pakistan, controls on bank lending rates and the fact that treasury bills counted toward the satisfaction of prescribed liquidity ratios meant that banks bought all the treasury bills. These purchases were financed by inflows of foreign currency accounts to banks. Consequently, the auction system failed to transmit higher interest rates through the banking system.)

In Central Europe, Bulgaria, Czechoslovakia, Hungary, Poland, and Romania all liberalized extensively—decontrolling interest rates and introducing auctions—while Yugoslavia introduced auctions without decontrolling interest rates. In none of these countries, however, were positive real (reference) interest rates realized except in Hungary in 1991 and Poland in 1990–91. Nevertheless, in the newly transforming economies (Bulgaria, Czechoslovakia, Poland, and Romania) there were significant increases in real interest rates, and it is likely that once rigidities and problems stemming from weak bank portfolios are eliminated real interest rates will move to moderate, positive levels.

More Bills, Less Money

Shifts in fiscal financing from banks to nonbanks, made possible by financial market reform, appear also to have enhanced the effectiveness of reforms in

⁸By contrast to auctions of treasury bills, the advantages of introducing auctions of central bank credit—where the debtor's creditworthiness is unknown—at an early stage for the economies in transition has been debated by Mathieson and Haas (1994) and Saal and Zamalloa (1994). Credit auctions are often used by central banks that wish to supply fixed amounts of liquidity to banks, with interest rates set according to the highest bidders. Where the banking system is poorly regulated—and where problems of adverse selection and moral hazard may arise—credit auctions may result in excessive interest rates because the least viable banks drive out the solvent ones. This problem may arise under any market system for the determination of interest rates when the banking system is not well regulated. Virtually all the instances of auctions cited in this paper concern those for treasury bills, for which this argument does not apply, except in Central Europe, where the initial auctions were generally for central bank credit.

⁹Ecuador and El Salvador freed interest rates only in 1992 and real interest rates rose in 1993. Argentina and Trinidad and Tobago had liberalized prior to the programs reviewed but because of high inflation (Argentina) and apparent rigidities in the absence of competition from auctions (Trinidad and Tobago) continued to experience negative real interest rates until the program period.

Table 3-3. Domestic Financing of the Public Sector and Real Interest Rates¹*(Country average; in percent of GDP)*

| | Domestic Financing Requirement ² | | | Real Interest Rate (Percent a year) |
|---|---|-------------------------------|----------------------------|--|
| | Overall | Nonbank financed ³ | Bank financed ⁴ | |
| 1. Advanced reformers with negative real rates at program outset ⁵ | | | | |
| Pre-program year | 4.5 | 1.7 | 2.9 | -12.7 |
| Program year(s) | 1.0 | 2.2 | -1.2 | -2.7 |
| 1992 | 2.6 | 1.6 | 1.0 | -1.1 |
| 2. Slow reformers with negative real rates at program outset ⁶ | | | | |
| Pre-program year | 3.3 | 1.0 | 2.3 | -4.5 |
| Program year(s) | 0.9 | 0.9 | — | -4.5 |
| 1992 | 5.0 | 0.1 | 4.9 | -5.1 |
| 3. Advanced reformers with positive real rates at program outset ⁷ | | | | |
| Pre-program year | 3.2 | 3.1 | 0.2 | 5.8 |
| Program year(s) | 0.9 | 1.2 | -0.3 | 1.4 |
| 1992 | -0.4 | 1.5 | -1.8 | 3.2 |

Source: IMF staff estimates.

¹Broadest definition of nonfinancial public sector available (initially central government); see Appendix Table 2-A1 in this volume. Averages differ slightly from those of Table 2-9 in this volume owing to the inclusion of Guatemala, Madagascar, and Uruguay.²Excluding arrears.³Nonbanks and residual.⁴Banking sector including central bank.⁵Advanced reformers are defined to include those countries that had both (i) liberalized interest rates and (ii) introduced auctions for short-term government and central bank paper by 1992. Data included here are for Costa Rica, Ecuador, Egypt, El Salvador, Honduras, Nigeria, Trinidad and Tobago, and Venezuela. Data exclude Argentina, Brazil, and Guyana, for which satisfactory program financing information is unavailable, and Central Europe.⁶Slow reformers are defined to include those countries that had (i) not decontrolled interest rates or (ii) not introduced auctions for short-term government and central bank paper or their equivalent by 1992. Data included here are for Algeria, Haiti, Jordan, Madagascar, and Pakistan. Data exclude Yugoslavia and Zaire, for which satisfactory program financing information is unavailable.⁷Guatemala, Jamaica, Mexico, Morocco, Papua New Guinea, Philippines, Tunisia, and Uruguay.

raising real interest rates.¹⁰ As discussed more fully in the paper on fiscal adjustment in this volume, the slow reformers and the advanced reformers with initially negative real interest rates started with a relatively low share of the public sector domestic borrowing requirement financed by nonbanks. By contrast, in advanced reformers that began with positive real interest rates, almost all of the domestic borrowing requirement on average was financed outside the banking system (Tables 3-3 and 3-4).

¹⁰An important consideration is whether monetary financing should be viewed as that from the central bank only or the whole banking system. In view of the prevalence of public ownership of commercial banks and the fact that treasury bills sometimes counted toward required reserves, monetary financing is taken to consist of financing from the banking system as a whole, rather than the central bank alone.

In countries that started with negative real interest rates and undertook vigorous financial sector reform, there was a pronounced shift in the proportion of borrowing from banks to nonbanks, which was accompanied by a rise in real interest rates. The process was especially noticeable in Costa Rica (1991–92), Egypt (1991–92), Honduras (1991–92), Nigeria (1989–90), Trinidad and Tobago (1990–92), and Venezuela (1990–92). In each of these countries real interest rates not only rose but also became positive. The experience of Nigeria illustrates the tensions caused by this adjustment. Specifically, the increase in real interest rates to an annual average of 14 percent in 1990 led to the reimposition of controls on bank interest rates and scaling back of treasury bill auctions. Real interest rates then returned to negative

Table 3-4. Financing of the Domestic Borrowing Requirement¹*(In percent of GDP)*

| | Domestic Borrowing Requirement ² | | | Borrowing from Nonbanks | | | Borrowing from Banks | | |
|--|---|-------------------------|------|-------------------------|-------------------------|------|----------------------|-------------------------|------|
| | Pre-program year | Program year(s) average | 1992 | Pre-program year | Program year(s) average | 1992 | Pre-program year | Program year(s) average | 1992 |
| 1. Advanced reformers with negative real interest rates at program outset³ | | | | | | | | | |
| Costa Rica | 0.7 | 0.3 | -0.9 | 0.4 | 1.3 | 1.2 | 0.3 | -1.0 | -2.1 |
| Ecuador | 2.2 | -3.3 | -0.4 | 0.8 | -0.1 | — | 1.4 | -3.2 | -0.4 |
| Egypt | 3.3 | 3.5 | 3.0 | 1.3 | 6.4 | 5.0 | 2.0 | -2.9 | -1.9 |
| El Salvador | 2.6 | 0.4 | 1.6 | — | -0.4 | 0.6 | 2.6 | 0.8 | 1.0 |
| Honduras | 3.9 | -0.9 | -0.8 | 1.7 | -1.3 | 0.5 | 2.2 | 0.4 | -1.3 |
| Nigeria | 9.8 | 4.6 | 13.4 | 5.6 | 4.7 | 3.6 | 4.2 | -0.1 | 9.8 |
| Trinidad and Tobago | 6.4 | 3.3 | 2.2 | 2.6 | 3.7 | 1.3 | 3.8 | -0.4 | 0.9 |
| Venezuela | 7.4 | 0.3 | 2.4 | 0.8 | 3.6 | 0.7 | 6.6 | -3.3 | 1.7 |
| 2. Slow reformers with negative real interest rates at program outset⁴ | | | | | | | | | |
| Algeria | -3.1 | -0.2 | 5.0 | — | 0.1 | -2.2 | -3.1 | -0.3 | 7.2 |
| Haiti | 1.2 | 2.2 | 10.8 | — | — | — | 1.2 | 2.2 | 10.8 |
| Jordan | 11.8 | -1.6 | — | — | 0.3 | 0.5 | 11.8 | -1.9 | -0.5 |
| Madagascar | -0.1 | -0.4 | 3.5 | 0.3 | 0.2 | 1.0 | -0.4 | -0.6 | 2.5 |
| Pakistan | 6.7 | 4.4 | 5.8 | 4.6 | 4.0 | 1.4 | 2.1 | 0.4 | 4.4 |
| 3. Advanced reformers with positive real interest rates at program outset | | | | | | | | | |
| Guatemala | 0.4 | 1.7 | 1.7 | 1.9 | 1.2 | 1.2 | -1.5 | 0.5 | 0.5 |
| Jamaica | -2.4 | -4.7 | -3.5 | 4.9 | -1.6 | -0.3 | -7.3 | -3.1 | -3.2 |
| Mexico | 13.6 | -1.2 | -3.5 | 6.9 | 0.6 | 0.4 | 6.7 | -1.8 | -3.9 |
| Morocco | 4.7 | 2.2 | 1.5 | 3.3 | 1.5 | 0.3 | 1.4 | 0.7 | 1.2 |
| Papua New Guinea | 1.1 | 3.2 | 4.7 | 0.3 | 0.8 | 1.6 | 0.8 | 2.4 | 3.1 |
| Philippines | 2.7 | 1.2 | -3.1 | 3.9 | 3.2 | 4.7 | -1.2 | -2.0 | -7.8 |
| Tunisia | 2.9 | 2.9 | 2.4 | 1.7 | 2.8 | 3.2 | 1.2 | 0.1 | -0.8 |
| Uruguay | 2.7 | 1.5 | -3.0 | 1.6 | 1.0 | 0.8 | 1.1 | 0.5 | -3.8 |

Source: IMF staff estimates.

¹Central government or nonfinancial public sector; for definitions see Appendix Table 2-A1 in this volume.²Excluding arrears.³Excluding Central Europe. Also excludes Argentina, Brazil, and Guyana, for which satisfactory financing data are unavailable.⁴Excludes Yugoslavia and Zaire, for which satisfactory financing data are unavailable.

levels.¹¹ The shift in funding was somewhat greater than planned in most of the other countries, possibly reflecting unexpectedly high demand for government paper. In most, it was sustained through 1992.

The experience of the advanced reformers contrasted with that of the slow reformers. Of these, only Pakistan had significant access to nonbanks—through tap issues of bonds—and controls on interest rates in the banking system prevented these from influencing deposit rates. Deficits in the slow re-

formers continued to be funded mainly through the banking system and its captive savers, while real interest rates generally remained negative.

Problem of Bad Debts

Large central bank losses and losses in the banking system as a whole that are absorbed or accommodated by the central bank may make positive real interest rates elusive, regardless of the level of nominal interest rates, when banks are subject to controls.¹² Conversely, if banks are freed completely of controls—particularly on spreads—but not provided

¹¹Indeed, the fact that by 1992 the average share of nonbank financing fell for advanced reformers with initially negative real interest rates, as reported in Table 3-3, reflects the overwhelming influence of the reversal in reliance on nonbank financing in Nigeria in 1991.

¹²For a discussion of the nature and role of central bank losses, see Fry (1993).

Table 3-5. Central Bank Losses¹*(In percent of GDP)*

| | Argentina | Costa Rica | Ecuador | El Salvador | Guatemala |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|
| 1986 | -1.6 | -3.8 | ... | ... | -1.9 |
| 1987 | -0.9 | -3.5 | ... | ... | -2.2 |
| 1988 | -0.5 | -3.3 | -2.2 | ... | -1.6 |
| 1989 | -4.5 | -2.7 | -2.5 | ... | -1.3 |
| 1990 | -0.7 | -2.0 | -2.9 | -1.0 | -2.1 |
| 1991 | -0.4 | -1.9 | -2.3 | -0.9 | -1.6 |
| 1992 | -0.1 | -2.0 | -0.9 | -0.7 | -1.2 |
| Change from pre-program year to: | | | | | |
| Average of program(s) | -2.1 | 1.2 | -0.5 | ... | 0.8 |
| 1992 | 0.4 | 1.3 | 1.3 | ... | 1.0 |

| | Jamaica | Philippines | Uruguay | Venezuela |
|----------------------------------|-------------|-------------|-------------|-------------|
| 1986 | -5.7 | -3.0 | -5.7 | ... |
| 1987 | -5.4 | -1.6 | -2.8 | -1.0 |
| 1988 | -5.4 | -2.1 | -3.1 | -2.2 |
| 1989 | -4.9 | -2.2 | -4.3 | -1.8 |
| 1990 | -4.3 | -2.0 | -4.5 | 2.0 |
| 1991 | -5.2 | -1.8 | -2.8 | -1.7 |
| 1992 | -5.3 | -1.3 | -2.0 | — |
| Change from pre-program year to: | | | | |
| Average of program(s) | 0.4 | 0.3 | 0.7 | 0.8 |
| 1992 | 0.1 | 0.8 | 2.3 | 2.2 |

Source: IMF staff estimates.

Note: Bold indicates a program year.

¹Guyana incurred central bank losses during 1988–92 but is excluded because GDP is subject to serious measurement problems. Honduras also experienced central bank losses, but only in 1990.

automatic central bank support, the existence of losses can lead to a widening of spreads and excessive lending rates.

Central bank losses usually arise because the central bank conducts quasi-fiscal activities such as subsidizing loans or offering exchange rate guarantees. Unless they are offset by regular capital infusions by the government, these losses lead to base money creation and thereby fuel inflation. (Sterilization through the issuance of bills may limit the initial monetary effect of losses but will add to the central bank's expenses and compound the loss in the later periods.) Such losses may explain why some countries that secured increases in nominal interest rates and reduced bank financing of nonfinancial public sector deficits nonetheless failed to achieve positive real interest rates. About a quarter of the countries under review had chronic central bank losses in the years prior to their programs (Table 3-5). On the whole, these were reduced during programs. In Argentina (1989) and Ecuador (1989–90) losses were large enough to have contributed to negative real interest rates during programs.

Losses of the banking system outside the central bank can also have a credit-creating effect if the central bank underwrites the banks or the enterprises responsible for the losses. If banks are subject to controls, moral suasion, or competition from banks with strong lending portfolios that limit their ability to widen spreads, rising nominal interest rates can weaken bank profits. This would occur if debtor enterprises are insolvent and cannot service higher interest burdens. Banks may then conceal these losses by writing up interest claims on the debtor enterprises. In these circumstances, increases in nominal interest rates may result in relatively rapid credit expansion, higher inflation, and little change in real interest rates. The greater the share of bad debts in the banking system, the less the leverage a given rise in nominal interest rates may have on real interest rates.¹³ Alternatively, if bank spreads are not constrained, banks may respond to rising base interest rates and a resulting

¹³For a discussion of this and other features of interest rate policy in Central Europe, see Bennett and Schadler (1992).

deterioration in enterprise debt servicing by widening spreads to gouge higher interest payments from solvent enterprises while keeping deposit rates low in order to contain their costs. The experience of Chile in 1979–83 is often cited as an example of real interest rates reaching excessive levels in the context of financial liberalization because bank portfolios were contaminated with existing bad debts. This effect is to be distinguished from the problem of adverse risk selection, which concerns the acquisition of new bad debts and is discussed below.

Both these effects may have occurred in Central Europe. Some estimates have put the share of non-performing assets in the banking system as high as two thirds at the outset of programs in Bulgaria (1991), Poland (1990), and Romania (1991); the problem is believed to have been smaller in Czechoslovakia and Hungary. The contrast between the experiences of Bulgaria and Romania, on the one hand, and Poland, on the other, illustrates the different effects that bad loans may have on real interest rates. In Poland, as the central bank pushed up nominal interest rates, banks responded by increasing spreads to over 80 percent in early 1990. Within a few months, limits on spreads were reimposed, but not before the banking system had largely recapitalized itself (although new losses may have arisen subsequently). By contrast, in Bulgaria and Romania, the widening of spreads as nominal interest rates rose was more limited, but credit growth proved difficult to contain, especially in Romania. Thus, despite large hikes in nominal rates, positive real interest rates (measured in terms of consumer prices) proved elusive in 1991–92.

Can Real Interest Rates Be Too High?

For many countries that achieved positive real interest rates, serious concerns arose over whether real interest rates had become too high. When interest rates are generally market determined the meaning of “excessive” real interest rates is questionable at best. Except when there is concrete evidence of market failure, it is not clear why interest rates reflecting market forces should ever be considered excessive. In practice, however, governments and IMF staff alike frequently become concerned about a high level of real interest rates and its potential effect on investment and growth. In general, this concern is focused as much on the possible causes of high real interest rates as on the level of interest rates per se. Nevertheless, the level of interest rates is frequently one of the first-noticed symptoms of an underlying problem and as such the appropriateness of real interest rates tends to be judged against some common

standards. Two such standards, albeit imperfect, suggest themselves.

The first is the level of real interest rates abroad, an indicator of global financial market conditions and, for large borrowers and lenders in a reasonably open (officially or de facto) system, an alternative to domestic interest rates. Even in relatively liberal financial markets, however, there are reasons to expect real interest rates to deviate from those abroad. First, interest rates in developing countries generally contain larger risk and liquidity premia than do those in industrial countries. These risk premia may vary over time. Second, at least when measured ex post, domestic real interest rates differ from those abroad by the expected changes in real exchange rates: when the real value of domestic currency is expected to depreciate (appreciate), domestic real interest rates should exceed (fall below) foreign real interest rates even if uncovered interest parity holds. Third, differences between the rates of return on domestic investments and those on foreign investments may be important. Specifically, while free trade in goods should ensure the equality of factor returns in the long run, over shorter periods the relative scarcity of capital in developing countries should produce relatively high returns to capital and real interest rates. Fourth, differences in the structure of tax systems can have important effects on interest rate differentials.¹⁴

The difficulty in establishing the “correct” difference between domestic and foreign interest rates suggests the need for a domestic indicator of the appropriate level for real interest rates. One possibility is the rate of output growth, which should over long periods of time be related to the rate of return on investment. Real rates of interest significantly above the long-run growth rate in many circumstances also exceed the long-run rate of return on investment and are not, therefore, sustainable.

Real interest rates in more than a third of the countries under review were significantly above one or both of these standards either during or after the programs under review (Table 3-6). The average real interest rate for the SDR during 1988–92 was 3.7 percent; interest rates for currencies ranged from 2.5 percent in the United States to 6.1 percent in France. Of the 13 countries that had positive real interest rates prior to programs, 3 were below this range and only 4 within it. During programs the number of countries with positive real interest rates rose to 16, and 4 were below and only 5 within the range of SDR currencies. By 1992 the number of countries with positive real interest rates had risen to 20; 5 were below the range and only 3 within. Overall, by

¹⁴See Frankel and MacArthur (1988) for a discussion of this issue.

Table 3-6. Real Interest Rates and Growth*(In percent a year)*

| | Real Interest Rate | | | Growth Rate | |
|---------------------|-------------------------------|------------------------------|-------------|------------------------------|-------|
| | Pre-program year ¹ | Program year(s) ² | 1992 | Average 1986–92 ³ | 1992 |
| Algeria | -8.2 | -11.1 | -11.7 | 0.5 | 2.8 |
| Argentina | -2.4 | 190.7 | -2.4 | 2.1 | 8.0 |
| Brazil | -14.5 | -4.7 | 29.8 | 1.4 | -0.9 |
| Bulgaria | -61.4 | -45.7 | -11.5 | ... | -5.6 |
| Cameroon | -8.6 | 8.4 | 13.1 | -5.1 | -2.7 |
| Congo | 10.1 | 6.9 | 9.0 | 0.4 | 2.6 |
| Costa Rica | -4.6 | -0.5 | 0.7 | 4.6 | 7.3 |
| Côte d'Ivoire | 5.0 | 10.5 | 6.4 | -0.9 | -1.8 |
| Czechoslovakia | -28.3 | -10.8 | — | ... | -5.9 |
| Ecuador | -25.0 | -6.1 | -3.4 | 2.6 | 3.7 |
| Egypt | -2.3 | 2.0 | 6.3 | 5.3 | 4.4 |
| El Salvador | -5.8 | 2.5 | -5.4 | 2.5 | 4.5 |
| Gabon | 18.2 | 1.7 | 14.6 | 0.2 | 0.5 |
| Guatemala | 2.4 | -2.7 | -2.0 | 3.2 | 4.8 |
| Guyana | -39.6 | -25.0 | 9.5 | 0.5 | 7.8 |
| Haiti | 2.8 | -1.5 | -15.9 | -3.1 | -12.0 |
| Honduras | -3.5 | -10.3 | 9.0 | 3.3 | 4.3 |
| Hungary | -2.4 | 0.1 | -1.6 | -2.7 | -4.4 |
| Jamaica | 10.3 | -5.3 | -3.8 | 3.5 | 1.8 |
| Jordan | -7.3 | -8.8 | 5.4 | 1.5 | 11.3 |
| Madagascar | -9.8 | 0.5 | -1.4 | 1.1 | 1.1 |
| Mali | 3.9 | 7.9 | 16.6 | 5.2 | 6.1 |
| Mexico | 10.0 | 7.2 | 2.2 | 1.9 | 2.7 |
| Morocco | 6.0 | 4.2 | 6.8 | 3.4 | -3.0 |
| Nigeria | -30.4 | -0.5 | -20.6 | 5.1 | 4.6 |
| Papua New Guinea | 6.3 | 4.2 | 5.2 | 3.5 | 9.0 |
| Pakistan | — | -1.7 | -1.6 | 5.3 | 3.0 |
| Philippines | 4.7 | 5.6 | 7.2 | 3.2 | — |
| Poland | -84.2 | 10.5 | -2.0 | -1.3 | 0.6 |
| Romania | -38.3 | -67.2 | -42.2 | ... | -15.4 |
| Trinidad and Tobago | -3.9 | -1.9 | 1.1 | -1.2 | -1.6 |
| Tunisia | 3.5 | 4.0 | 7.3 | 4.0 | 8.0 |
| Uruguay | 1.4 | -7.3 | 2.0 | 4.1 | 7.4 |
| Venezuela | -26.0 | -7.1 | 3.3 | 4.7 | 7.3 |
| Yugoslavia | -42.1 | -30.5 | ... | -2.8 | ... |
| Zaire | -33.4 | -7.0 | -96.0 | 1.7 | ... |

Sources: Appendix Table 3-A1 and IMF staff estimates.

Note: Bold indicates the 15 countries where real interest rates exceeded the highest interest rate among the currencies of the SDR, 6.1 percent for 1988–92, either during programs or in 1992.

¹Average real interest rate in the pre-program year.²Average annual real interest rate during the program year(s).³Average rate of growth of real GDP over the 1986–92 period.

this criterion, 15 countries experienced very high real interest rates either during or immediately after programs. While high real interest rates occurred quite frequently, however, they also tended to be temporary: of the six countries that started with interest rates above the SDR range, all but Morocco saw a drop during their programs. Also, where real

interest rates exceeded the SDR range during their programs, they had typically fallen by 1992. The only exceptions were the CFA countries.

In measuring the incidence of high real interest rates, the growth rate criterion presents an even less favorable picture than the SDR interest rate. Most real interest rates—where positive—exceeded aver-

age growth rates, both during programs and in 1992. A more generous criterion for 1992 would be the rate of growth recorded for that year alone, which tended to be above average and may have exerted cyclical effects on credit demand. Even this criterion was exceeded in nearly two thirds of countries with positive real interest rates.

While these two yardsticks suggest that high real interest rates may have been a common problem during and after programs, they are not conclusive. The criteria employed are imperfect and represent only a possible threshold of concern. The fact that different criteria tend to give different results for individual countries, if not for the group as a whole, highlights the difficulties in deciding whether to try to bring real rates down—a decision that must reflect judgments about the forces that drove interest rates up in the first place. For the countries under review, four possible sources of excessive upward pressure on interest rates stand out: (i) large-scale government borrowing; (ii) the usually temporary effects of financial liberalization; (iii) the cost of disinflation when policies lack credibility; and (iv) the choice of exchange rate peg. Even when real interest rates were viewed as excessive, questions arose about whether the cause of the high real interest rate needed to be addressed; the answer, of course, depended in part on whether the causes were likely to be temporary.

Governments That Borrow Too Much

For many countries that significantly liberalized the financial sector and thereby opened channels for nonbank financing, there was a marked shift of public sector financing from banks to nonbanks. The extent to which this shift raised real interest rates depended on the balance between cutting the deficit and shifting financing from bank to nonbank sources. While there was infrequently an explicit estimate of the appropriate or sustainable balance, excessive reliance on switching financing sources rather than reducing the domestic financing requirement would tend to push real interest rates to excessive levels. Unless the financing requirement could be reduced, the choice was between living with high real interest rates or scaling back bond issues and compromising the inflation objective.

Among the 15 countries that might have been concerned, at various stages, about the high level of their real interest rates, Tunisia and the Philippines appear to have been significantly affected by large bond-financed public sector deficits (Table 3-4). For Tunisia, the borrowing was to finance the nonfinancial public sector, whereas in the Philippines heavy borrowing (overfunding) by the national government was to cover not so much its own deficit as the

losses of the central bank (Table 3-5). Public borrowing may have contributed to high real rates in Morocco also, but mainly through the large financing requirements of quasi-public enterprises excluded from the public sector accounts.¹⁵ Both Morocco and Tunisia may also have been affected by the very high real interest rates in Europe during 1990–92.

Quest for Credibility

Extremely high real interest rates often occur in the early stages of disinflation programs when credibility is in question. Whether such programs rely on orthodox fiscal adjustment alone or a heterodox approach of fiscal adjustment and the use of a nominal anchor, most have resulted in a brief period of high real interest rates as credit conditions are tightened and actual inflation falls faster than expected inflation. These super-high real interest rates are typically temporary—programs either fail or succeed—and are the cost of insufficient policy credibility. The greater the confidence that can be established through early implementation of policies—especially fiscal restraint—the lower the premium that must be paid.

In four countries, Argentina (1990), Brazil (1992), Mexico (1989), and Poland (1990), real interest rates reached super-high levels (ranging from 31 percent a year in Mexico in June 1989 to 85 percent per month in Argentina in March 1990), all in connection with disinflation programs. In Argentina the very high real interest rates of early 1990 resulted at least in part from the failure of the exchange rate anchor in the second half of 1989. With the exchange rate plummeting, the authorities reacted by severely tightening credit policies, which required super-high real interest rates until measures introduced in March 1990 restored confidence and brought greater—if incomplete—stability to the exchange market. By contrast, Argentina's establishment of a currency board in early 1991 (outside the program reviewed) achieved instant credibility and avoided high real interest rates. In Brazil, the sharp tightening of credit policies in early 1992 had little effect on confidence or inflation because fiscal adjustment was inadequate. Credit conditions were subsequently eased and real interest rates fell.

¹⁵Venezuela also suffered from this kind of fiscal pressure, but the rise in real interest rates to high levels took place principally in 1993. Here the process was more roundabout—in the first instance the heavy public sector borrowing was from abroad. Since a large share of the proceeds was spent domestically, the ex ante monetary expansion had to be sterilized, with similar effects to those that would have occurred if the borrowing had been satisfied domestically.

In Mexico and Poland, a critical element of the disinflation programs of 1989–90 was the fixing of the exchange rate. To defend the peg, nominal interest rates needed to be kept high, either administratively (Poland) or through tight credit (Mexico), despite rather rapid declines in inflation. Measures of ex post real interest rates soared although, assuming ex ante inflation expectations adjusted more slowly than actual inflation, real interest rates measured in terms of inflation expectations were probably lower. In the event the strategy paid off: confidence grew as fiscal adjustment was effected, and real interest rates declined sharply.

Does Freedom Have a Price?

In most countries that removed interest rate controls or introduced auctions, there was concern about whether the liberalization itself—independent of accompanying policy—would produce an overshoot of the real interest rate.¹⁶ Some disequilibrium can occur immediately following liberalization if the reaction of portfolio holders to increased offerings of public debt is low. More generally, the novelty of free interest rates may produce some initial disorientation among market participants. Apart from these temporary adjustment problems, two structural features of financial markets have raised concern in some countries that real interest rates could persist at high levels. The first is the possibility that with a small number of domestic banks and limits on foreign participation in banking activities, oligopolistic practices will allow banks to increase and maintain large spreads. The second is that when bank supervision and prudential standards are weak and there is a perception of implicit government guarantees, banks may raise interest rates to high levels, thereby driving away low-risk borrowers unable to pay high interest rates.¹⁷ Interest rates may persist above levels that would prevail in a better regulated system as banks accept a portfolio with higher-than-optimal risk.

¹⁶Galbis (1993) discusses the effects of liberalization on real interest rates. Khan and Sundararajan (1991) discuss the effects of financial sector reform on the practice of monetary policy.

¹⁷See Villanueva and Mirakhor (1990) for a discussion of this issue. The argument derives from the framework of adverse selection in financial markets developed by Stiglitz and Weiss (1981). They argue that in a well-regulated banking system, banks with imperfect information about the riskiness of potential borrowers will set interest rates below market-clearing levels and ration funds in order to retain an adequate share of creditworthy borrowers who would be driven out by market-clearing interest rates. This rationing process differs significantly from that resulting from official controls on interest rates because it results from the optimizing behavior of well-regulated banks aiming to preserve the quality of their portfolios rather than from government dictates that frequently push banks to lend to uncreditworthy borrowers.

In practice, it is difficult to disentangle such disequilibrating effects from myriad other influences on interest rates in the aftermath of liberalizations, particularly shifts in financing patterns following the introduction of auctions. This difficulty is particularly evident for Egypt and Honduras, where there were concerns about disequilibrating effects from liberalization but there was also a sizable tightening of credit conditions through the sale of treasury bills in the newly created auction.

For many countries, initial upward pressures or real interest rates associated with liberalization appear to have been reversed by large capital inflows attracted by the increase in interest rates.¹⁸ More than half of the countries under review outside Central Europe and the CFA experienced unusually large private capital inflows during this period and all but three of these were countries where real interest rates had recently risen to positive levels (Table 3-7). (One of these exceptions was Pakistan, which enjoyed positive real interest rates on treasury bills but not in the banking system as a whole.) Outside the CFA, eight of the ten countries where real interest rates reached levels that caused concern experienced such inflows. This was typically an equilibrating influence: where inflows were not fully sterilized and large fiscal deficits were not a source of pressure on interest rates, the inflows appear to have contributed to an easing of interest rates.

Private capital inflows were more likely to occur after the capital account had been at least partially freed of restrictions.¹⁹ However, whether countries liberalizing their domestic financial systems should simultaneously ensure that their capital accounts are open is subject to question.²⁰ While inflows would bring welcome respite to temporary bottlenecks or interest rates rigidities in an oligopolistic system, they may exacerbate the destabilizing effects of excessive risk taking in a poorly regulated system. Critical ingredients for allowing capital inflows to reduce interest rates in newly liberalized systems are effective regulation and restraint of public sector borrowing.

¹⁸Other aspects of the adjustment and reform programs that contributed to improving investment opportunities also played a role in attracting the inflows as discussed in Schadler, Carkovic, Bennett, and Kahn (1993).

¹⁹Jordan and Pakistan were exceptions. In Jordan, the exceptional inflows were primarily workers' remittances. While the increase in real interest rates may have encouraged these inflows, the disturbances brought about by the Middle East conflict were probably equally responsible. In Pakistan, inflows—also possibly related to the Middle East conflict—were in the form of foreign currency deposits.

²⁰This question is raised principally by the experience of the Southern Cone countries in the late 1970s. The literature in this area is extensive—see, for example, McKinnon (1993).

Table 3-7. Private Capital Inflows and Capital Account Liberalization, 1988-92¹

| | Abnormally Large Capital Inflows ² | Unification of Exchange System | Liberalization of Capital Account | |
|---------------------|--|-----------------------------------|-----------------------------------|-------------|
| | | | Full ³ | Partial |
| Algeria | — | From outset | — | 1990 |
| Argentina | 1991-92 (-) | 1989 | — | 1989 |
| Brazil | 1992 (+) | — | — | 1992 |
| Costa Rica | 1992 (+) | From outset | 1992 | — |
| Ecuador | — | — | — | 1991 |
| Egypt | 1991-92 (+) | 1991 | — | 1991 |
| El Salvador | 1990-91 (+) | 1990 | — | 1992 |
| Guatemala | 1991-92 (+) | 1988 | 1988 | — |
| Guyana | 1991-92 (+) | 1991 | — | 1991 |
| Haiti | — | 1991 ⁴ | — | — |
| Honduras | 1992 (+) | — | — | 1992 |
| Jamaica | — | From outset | — | 1991 |
| Jordan | 1991-92 (+) | 1990 ⁴ | — | — |
| Madagascar | — | — | — | — |
| Mexico | 1989-92 (+) | 1991 | — | 1989 |
| Morocco | 1989-90 (+) | From outset | — | 1988 |
| Nigeria | — | 1989 | — | — |
| Pakistan | 1991-92 (-) ⁵ | From outset | — | — |
| Papua New Guinea | — | From outset | — | From outset |
| Philippines | 1991 (+) | From outset | — | 1991 |
| Trinidad and Tobago | — | From outset | — ⁶ | — |
| Tunisia | — | From outset | — | — |
| Uruguay | 1990-92 (-) | From outset | 1991 | From outset |
| Venezuela | 1991 (+) | 1989 | — | 1990 |
| Zaire | — | 1991 ⁷ | — | — |

Sources: IMF, *Annual Report on Exchange Arrangements and Exchange Restrictions*, various issues; and staff estimates.

¹All countries under review except those in Central Europe and the CFA franc zone.

²Positive (negative) sign indicates that positive (negative) real interest rates prevailed at the time of the inflows.

³Where capital controls were eliminated or, in Uruguay, where minor controls that remained were not strictly enforced.

⁴Multiple rate systems replaced unified systems in 1989.

⁵Real interest rates were negative in money market but positive for treasury bills.

⁶Fully liberalized in 1993.

⁷Multiple rate system replaced unified systems in 1990.

Whose Monetary Policy?

Unlike most of the other countries with positive real interest rates where private capital inflows were significant, the CFA countries for the most part faced incipient capital outflows. In the context of the fixed exchange rate regime, interest rates had to be higher than those in France to stem outflows. Low domestic inflation combined with high nominal interest rates to produce real interest rates well above those of industrial countries or the countries' own recent growth trends.

Concluding Observations

- The progress made in liberalizing financial systems during the programs under review was im-

pressive. Starting from often repressed financial systems, there was a widespread effort to decontrol bank interest rates and expand the range of markets, particularly through the introduction of auctions: whereas only 5 of the 36 countries under review had significantly decontrolled interest rates and introduced auctions for government paper before the start of the programs under review, about two thirds of them had taken these steps by 1992. These reforms had an important effect on the level of real interest rates and shifted the role of financial markets from one of redistributing financial resources by government dictates to that of allocating them according to market principles.

- In newly liberalized environments, real interest rates moved significantly closer to the moderately positive range typically consistent with an efficient allocation of resources and adequate incen-

tives to financial savings. While about two thirds of the countries under review started their programs with negative real interest rates, less than a quarter still had significantly negative real interest rates by 1992.

- Liberalization also allowed a significant widening of spreads that frequently persisted. Insofar as this resulted from high reserve ratios, it could have been averted by appropriate action on such requirements. More often, however, this problem appeared to stem from ongoing inefficiencies in the banking system and from attempts by banks to recapitalize. In these circumstances, it is important to consider actions to force banks to operate more efficiently by introducing as much competition as possible—if necessary from foreign banks—and to recapitalize banks prior to or concurrently with liberalizing interest rates.
- The countries that continued to experience negative real interest rates, or even saw positive real interest rates slip to negative levels, experienced one or more of several problems: still-repressed financial systems; persistently large bank-financed public borrowing requirements; or sizable central bank losses or nonperforming loans in a banking system underwritten by the central bank. The effects of these weaknesses on the level of real interest rates was a symptom of the underlying impediment they posed for the efficient operation of financial markets.
- The success in liberalizing financial markets and raising negative real interest rates at times spawned another problem—real interest rates that were high by international standards or relative to countries' own growth rates. There were a number of influences at play: large government borrowing requirements satisfied principally through non-bank markets; the disequilibrium, oligopoly, and moral hazard problems that can accompany liberalization in poorly regulated markets; efforts to establish credibility in the early stages of a disinflation program; and in the CFA franc zone, the defense of an exchange rate fixed to the French franc, which also carried high real interest rates.
- For most of the countries under review high real interest rates were transitory—as markets settled down or credibility was established. Nevertheless, even short periods of high real interest rates are disruptive, and efforts to eliminate overshooting of interest rates are important. More generally, while the typically short duration of high real interest rates in the countries reviewed is reassuring, this should not dismiss concerns about the risks of sustained periods of high real interest rates during programs. Specifically, if nonbank-financed government borrowing requirements are not brought down or if the banking system remains poorly reg-

ulated after liberalization, there are real risks of sustained high real interest rates or excessive spreads with adverse consequences for growth and the quality of banks' balance sheets.

- For some countries private capital inflows appear to have helped reduce real interest rates from very high levels. In deciding on the sequence of the liberalization of domestic financial markets and the external capital account, however, it is crucial to weigh the benefits of equilibrating inflows against the potential for large external borrowing to feed excessively risky domestic bank lending. A crucial consideration in this decision is whether domestic prudential controls and bank supervision are strong enough to circumscribe banks' behavior.
- This study has focused on the interaction between financial policies and the behavior of interest rates. It clearly leaves unanswered the important question of how increases in real interest rates affect economic performance—saving, investment, efficiency, and growth. Theoretically, increases in real interest rates from disequilibrium negative levels to moderately positive levels should not crowd out private investment, and in fact could secure a more efficient resource allocation and possibly higher private saving. Concerns about crowding out and longer-term effects on investment and growth, however, do arise when real interest rates climb to very high levels as a result of the kinds of disequilibrating behavior discussed in this study.

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Appendix Tables

Table 3-A1. Interest Rate Definitions

Interest rates have been chosen for each country so as to be as representative as possible and in the center of the range of deposit and lending rates. Real interest rates have been calculated by employing a part forward-looking, part backward-looking formula for inflation by adjusting the nominal interest rate for the 12-month rate of consumer price inflation, calculated 6 months forward. This formula was applied for all countries except Argentina, Brazil, and Uruguay, and those in Central Europe, where a shorter-term, ex post definition was employed because of the high and variable rates of inflation in these countries. Interest rates are pretax. Posttax calculations would depend on the type and income bracket of investor. Such estimates would alter both international and intertemporal comparisons.

| | Interest Rate | Term |
|---------------------|---------------------------------|-----------|
| Algeria | Money market | — |
| Argentina | Interfirm rate | 7 days |
| Brazil | Money market | Overnight |
| Bulgaria | Refinance rate | — |
| Cameroon | BEAC discount rate | — |
| Congo | BEAC discount rate | — |
| Costa Rica | Deposit rate | 1 month |
| Côte d'Ivoire | BCEAO discount rate | — |
| Czechoslovakia | Refinance rate | — |
| Ecuador | Certificate of deposit | 3 months |
| Egypt | Treasury bills ¹ | 3 months |
| El Salvador | Deposit rate | 6 months |
| Gabon | BEAC discount rate | — |
| Guatemala | Deposit rate | 6 months |
| Guyana | Treasury bills | 3 months |
| Haiti | Deposit rate ² | 1 month |
| Honduras | Certificate of deposit | 6 months |
| Hungary | Treasury bills | 3 months |
| Jamaica | Treasury bills | 3 months |
| Jordan | Discount rate | — |
| Madagascar | Rediscount rate | — |
| Mali | BCEAO discount rate | — |
| Mexico | Treasury bills | 1 month |
| Morocco | Treasury bills | 3 months |
| Nigeria | Treasury bills | 3 months |
| Papua New Guinea | Treasury bills | 6 months |
| Pakistan | Money market | — |
| Philippines | Treasury bills | 3 months |
| Poland | Refinance rate | — |
| Romania | Refinance rate | — |
| Trinidad and Tobago | Treasury bills | 3 months |
| Tunisia | Money market | Overnight |
| Uruguay | Central bank bills | 2 months |
| Venezuela | Central bank bills ³ | 3 months |
| Yugoslavia | Discount rate | — |
| Zaire | Discount rate | — |

Note: BEAC = Bank of Central African States; BCEAO = Central Bank of West African States.

¹One-year deposit rate prior to 1991.

²Maximum allowable rate until 1989, when deposit rates were freed.

³Discount rate prior to 1990.

Table 3-A2. Monetary Control Reforms, 1986-92

| | Interest Rate Controls | Credit Ceilings | Reserve Requirements | Auctions | Open Market Operations | Discount Window/Loans |
|-----------------------|--|--|---------------------------------|--|--|---|
| Algeria | Maximum lending rate | No | Passive | No | No | Funds rationed since July 1991. Fixed rate of interest |
| Argentina | Lifted in October 1987 | No | Active | Central bank paper auctioned from October 1987 | Yes, using treasury bills initially, then central bank paper | From October 1992, rediscounts limited to 30 days and limited in amount to bank's capital |
| Brazil | Savings deposit rates set by the authorities at margin over "reference rate" linked to inflation | No | Occasionally active | Central bank bills auctioned from June 1986. Treasury bills auctioned from November 1987 | Yes, since 1986 | Funds elastically supplied through Conto de Movimento until 1988 |
| Bulgaria | Liberalized in February 1991, but "guidance" still applied | Yes | Introduced April 1990, passive | Yes, treasury bills from July 1991 | No | Shift from uncollateralized to collateralized lending during 1991-92. Fixed rate |
| Cameroon (BEAC) | Rules set by BEAC simplified in October 1990 | Introduced in September 1988 | Liquid asset ratio, passive | No | No | Strict limits on rediscounting. Fixed rate of interest |
| Congo (BEAC) | Rules set by BEAC simplified in October 1990 | No | Liquid asset ratio, passive | No | No | Strict limit on rediscounting. Fixed rate of interest |
| Costa Rica | Controls abolished in 1989 | Imposed in 1988, abolished in January 1992 | Active | Central bank stabilization bonds auctioned from 1990 | Yes, since 1990 | Active use of rediscount facility. Rate of interest 2 percent above government bonds since 1990 |
| Côte d'Ivoire (BCEAO) | Yes | Removed in October 1989 | Liquidity ratio, passive | No | No | Strict limits on rediscounting. Fixed rate of interest |
| Czechoslovakia | Yes. Ceilings removed in April 1992 | Yes, but lifted in October 1992 | Introduced October 1990, active | Central bank refinancing auctions begun during 1991 | Yes, since July 1992 | Refinance window phased out in early 1992 |
| Ecuador | Lifted in August 1986. Reintroduced in August 1988. Lifted again in September 1992 | No | Passive | Auctions of central bank bills begun in December 1992 | Yes | Since July 1991 rate of interest set at 15 percent above lowest banking system reference rate |
| Egypt | Lifted in January 1991 | Yes, until July 1993 | Passive | Treasury bill auctions begun in January 1991 | Yes, implicit, since January 1991 | Inactive since 1991 |
| El Salvador | Yes, but controls on interbank rates lifted in September 1990. Rates on loans for more than one year, deposits over six months freed in July 1991. Last controls removed in March 1992 | No | Passive | Begun in 1991 | Begun in 1991; main monetary policy instrument from then on | Inactive since 1991 |
| Gabon (BEAC) | Rules set by BEAC simplified in October 1990 | No | Passive | No | No | Strict limits on rediscounting. Fixed rate of interest |

| Guatemala | Removed in late 1989 | Informal ceilings removed in 1991 | Passive | Yes, CENIVACUS | Active use begun in 1989, initially using CENIVACUS then with central bank CDs | Inactive since 1989 |
|--------------|---|---|---|---|---|--|
| Guyana | Liberalized at beginning of 1991, but minimum deposit rates retained | Yes, but removed in 1989 | April 1991, 80 percent of excess reserves converted into debentures | Yes, for treasury bills from June 1991 in effective tenders begun in March 1987 | Yes, since 1991, mainly to sterilize capital inflows | Not very active owing to the liquidity of banking system |
| Haiti | Yes, but wide bands loosened further in December 1989, though overall ceiling on loan ratios remained | No | Active | No | No | Refinancing at discretion of central bank |
| Honduras | Free after October 1990, when lending rate ceilings removed | No | Active | Introduced for government bonds in 1990. Not very effective | Sporadically in 1990, more actively later | Liquidity window, little used. Interest rate set at market lending rate plus 3 percent |
| Hungary | Free for enterprise deposits and loans from 1987. For households, partially liberalized in 1989 | Removed in 1987 | Passive | First auction of treasury bills in December 1988. From February 1991, portion of central bank refinance allocated in auction | Began in 1990, after 1991 able to effect open market operation by altering timing of government funding | Refinancing facilities available on various terms subject to overall ceilings. Rates of interest set by central bank |
| Jamaica | Floor on savings deposits removed in October 1990 | Removed in January 1991 | Active | Auctions begun for central bank CDs and treasury bills in August 1988 | Yes, since 1985 | Rediscount facility without limits abolished in 1990 |
| Jordan | Deposit rates freed in September 1988. Lending rates freed in February 1990 | Loan/deposit ratio | Active | No | No | Rediscounting at discretion of central bank |
| Madagascar | Minimum rates for deposits from individuals. From December 1986, banks "invited" to set interest rates on the basis of central bank discount rate | Yes | Introduced in March 1987, passive | Treasury bills auctioned since 1987 to nonbanks. Banks permitted to participate since September 1988. From November 1990, dual system of auctions (Appel d'Offres) to relieve or absorb liquidity | No | Discount window abolished November 1990 |
| Mali (BCEAO) | Yes | Removed in October 1989 | Liquidity ratio, passive | No | No | Strict limits on rediscounting. Fixed rate of interest |
| Mexico | Controls lifted in April 1989 | Sectoral credit ceilings until end-1988 | Reserve requirement changed to liquid asset ratio in April 1989 | Treasury bill auctions, from April 1989 | Actively used from mid-1980s | Loans made on discretionary basis by central bank |
| Morocco | Maximum lending and minimum deposit rates. Controls steadily liberalized during 1986-92. Mostly free by end-1992 | Yes, but lifted in January 1991 | Active | Treasury bill auction begun in February 1989, limited to banking system until December 1990 | No | Discretionary lending (advances) to money market at fixed interest rate |
| Nigeria | Lifted in 1987, reintroduced January 1991, removed beginning of 1992 | Yes | Active | Treasury bill auctions begun in November 1989 | No | Rediscounting at the discretion of the central bank |

Table 3-A2 (concluded)

| | Interest Rate Controls | Credit Ceilings | Reserve Requirements | Auctions | Open Market Operations | Discount Window/Loans |
|---------------------|--|--|--|--|---------------------------------------|---|
| Papua New Guinea | No | Yes, during 1989-90 | Active liquid asset ratio until 1990, passive thereafter | Treasury bills auctioned from mid-1991 | From June 1991 | Discounting at the discretion of the central bank. Since January 1992, interest rate adjusted daily |
| Pakistan | Ceiling for loan rates. Deposit rates free subject to central bank clearance | Yes, but replaced with loan/deposit ratio in July 1992 | Passive | Introduced for government securities from March 1991 | No | 3-day unlimited repurchase facility at fixed rate of interest |
| Philippines | No | No | Active until 1989 | Yes | Effectively via overfunding | Reverse repurchase, fixed rate, charged periodically and linked to market rate |
| Poland | Freed in January 1990, controls on spreads reintroduced in February 1990. Moral suasion applied until 1992 | Yes | Active | Introduced July 1990 for central bank bills and from April 1991 for central bank repurchase agreements. Treasury bills from May 1991 | From January 1990 | Refinance, rediscount, and Lombard credit available on various terms and at interest rate fixed by central bank |
| Romania | Lifted in April 1991 | Yes | Introduced in January 1992, passive | Auction of central bank credits begun in summer 1992 | No | Funds supplied at discretion of central bank |
| Trinidad and Tobago | No | Guidelines | Active | Yes. Nonbanks allowed to participate in auctions from 1988 | No | Funds fairly elastically supplied until November 1992. Fixed rate of interest |
| Tunisia | Interest rates partially liberalized in 1987. Nonbanks allowed to participate in money markets in January 1988 | No | Supplementary reserve requirement introduced in late 1989, removed in 1991 | Appel d'Offre system for providing liquidity to money market introduced in January 1988 | No | Rediscounting facility curtailed in 1988 |
| Uruguay | No | No | Active | Central bank bills auctioned from June 1990 | Yes | Discounting at discretion of central bank at margin over market rate |
| Venezuela | Abolished in 1989, reintroduced in April 1990 but with wide bands | Removed in 1990 | Passive | First market sales of central bank paper in stock market in 1989. Regular auctions from August 1990 | Begun in 1989 with central bank paper | Infrequently used since 1990. Rate equal to market rate plus premium |
| Yugoslavia | Yes (indexation 1988-89) | Yes | Active | Begun in 1990 | Begun in 1990 | Funds supplied at fixed interest rate |
| Zaire | No | No | Active | No | No | Funds supplied at fixed interest rate to money market |

Source: IMF staff estimates.

Note: BEAC = Bank of Central African States; BCEAO = Central Bank of West African States; CENIVACUS = short-term central bank negotiable instruments backed by treasury bonds.

Table 3-A3. Interest Rates in Central Europe*(Annual average; percent a year)*

| | Bulgaria | Czechoslovakia | Hungary | Poland | Romania | Yugoslavia |
|---|-----------------------|----------------------|----------------------|----------------------|-----------------------|--------------------|
| Real interest rates | | | | | | |
| 1986 | ... | ... | ... | ... | ... | ... |
| 1987 | ... | ... | ... | ... | ... | ... |
| 1988 | ... | ... | -2.9 ^A | -34.3 | ... | -22.2 |
| 1989 | ... | ... | -2.4 ^{A, F} | -84.2 | ... | -42.1 |
| 1990 | -61.4 | -28.3 | -4.2 ^{A, F} | 18.4 ^A | -38.3 | -30.5 ^A |
| 1991 | -45.7 ^{A, F} | -10.8 ^A | 6.0 ^{A, F} | 2.5 ^{A, F} | -67.2 ^F | -69.7 ^A |
| 1992 | -11.5 ^{A, F} | — ^{A, F} | -1.6 ^{A, F} | -2.0 ^{A, F} | -42.2 ^{A, F} | ... ^A |
| Change from pre-program year to: | | | | | | |
| Average of program(s) | 15.7 | 17.5 | 2.5 | 94.7 | -28.9 | 11.6 |
| 1992 | 49.9 | 28.3 | 0.8 | 82.2 | -3.9 | ... |
| Nominal interest rates | | | | | | |
| 1986 | ... | ... | ... | ... | ... | ... |
| 1987 | ... | ... | ... | ... | ... | ... |
| 1988 | ... | ... | 11.1 ^A | 6.2 | ... | 256.6 |
| 1989 | ... | ... | 20.5 ^{A, F} | 87.0 | ... | 2,733.3 |
| 1990 | 4.5 | 5.8 | 30.1 ^{A, F} | 104.8 ^A | 2.7 | 22.2 ^A |
| 1991 | 55.3 ^{A, F} | 9.9 ^A | 34.6 ^{A, F} | 53.6 ^A | 12.7 ^F | 37.5 ^A |
| 1992 | 61.4 ^{A, F} | 12.8 ^{A, F} | 22.7 ^{A, F} | 39.0 ^{A, F} | 61.8 ^{A, F} | 53.3 ^A |
| Change from pre-program year to: | | | | | | |
| Average of program(s) | 50.8 | 4.1 | 8.6 | -7.8 | 10.0 | -2,711.1 |
| 1992 | 56.9 | 7.0 | 2.2 | -48.0 | 59.1 | ... |

Sources: IMF, *International Financial Statistics*, various issues; and staff estimates.

Note: Bold indicates a program year. "A" denotes existence of auctions for treasury bills, certificates of deposit, or central bank refinance. "F" denotes freedom of commercial bank loan and deposit rates.

Table 3-A4. Interest Rates in Advanced Reformers with Negative Real Interest Rates at Program Outset¹
(Annual average; percent a year unless noted otherwise)

| | Argentina ² | Brazil ² | Costa Rica | Ecuador | Egypt | El Salvador | Guyana | Honduras | Nigeria | Trinidad and Tobago | Venezuela | Average ³ |
|-------------------------------------|------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|---------------------|----------------------|----------------------|
| Real interest rates | | | | | | | | | | | | |
| 1986 | 0.7 | 0.3 ^{A,F} | 0.2 | — | -11.3 | -11.5 | -0.2 | 7.9 | -3.3 | -5.4 ^F | -6.2 | -3.3 |
| 1987 | 1.3 ^{A,F} | -1.3 ^{A,F} | -2.5 | -4.2 | -3.7 | -4.8 | -18.8 | 7.9 | -11.4 | -3.6 ^F | -17.8 | -6.5 |
| 1988 | -1.2 ^{A,F} | -0.4 ^{A,F} | -4.6 | -25.0 | -7.5 | -2.2 | -29.1 | 3.5 | -30.4 ^F | -3.9 ^{A,F} | -26.0 | -13.9 |
| 1989 | -3.2 ^{A,F} | 1.7 ^{A,F} | 0.8 | -11.4 | -7.8 | -5.8 | -39.6 | -3.5 | -9.0 ^{A,F} | -3.4 ^{A,F} | -22.9 ^{A,F} | -11.4 |
| 1990 | 12.5 ^{A,F} | -0.4 ^{A,F} | -3.9 ^F | -0.8 | -2.3 | — | -30.5 | -16.7 ^{A,F} | 14.3 ^{A,F} | -0.5 ^{A,F} | -1.2 ^{A,F} | -4.6 |
| 1991 | -0.3 ^{A,F} | 0.6 ^{A,F} | 0.5 ^{A,F} | -1.7 | -2.4 ^{A,F} | 4.9 ^A | -19.4 ^{A,F} | -3.9 ^{A,F} | -6.8 ^{A,F} | 3.9 ^{A,F} | 2.7 ^{A,F} | -2.5 |
| 1992 | -0.2 ^{A,F} | 2.2 ^{A,F} | 0.7 ^{A,F} | -3.4 ^{A,F} | 6.3 ^{A,F} | -5.4 ^{A,F} | 9.5 ^{A,F} | 9.0 ^{A,F} | -20.6 ^{A,F} | 1.1 ^{A,F} | 3.3 ^{A,F} | 0.1 |
| Change from pre-program year(s) to: | | | | | | | | | | | | |
| Average of program(s) | 4.9 | 0.9 | 4.1 | 18.9 | 4.3 | 8.3 | 14.6 | -6.8 | 29.9 | 2.0 | 18.9 | 10.5 |
| 1992 | — | 3.5 | 5.3 | 21.6 | 8.6 | 0.4 | 49.1 | 12.5 | 9.8 | 5.0 | 29.3 | 15.7 |
| Nominal interest rates | | | | | | | | | | | | |
| 1986 | 6.1 | 4.4 ^{A,F} | 16.7 | 26.6 | 11.0 | 15.0 | 12.8 | 11.5 | 8.5 | 4.0 ^F | 8.9 | 12.8 |
| 1987 | 10.3 ^{A,F} | 13.5 ^{A,F} | 14.1 | 29.9 | 11.0 | 15.0 | 11.3 | 10.8 | 11.7 | 4.6 ^F | 8.9 | 13.0 |
| 1988 | 13.9 ^{A,F} | 22.7 ^{A,F} | 15.2 | 35.3 | 11.0 | 15.0 | 11.0 | 11.0 | 11.9 ^F | 4.8 ^{A,F} | 9.0 | 13.8 |
| 1989 | 44.4 ^{A,F} | 31.7 ^{A,F} | 13.6 | 38.3 | 11.7 | 16.3 | 13.0 | 10.1 | 15.4 ^{A,F} | 7.1 ^{A,F} | 29.2 ^{A,F} | 17.4 |
| 1990 | 41.7 ^{A,F} | 25.4 ^{A,F} | 21.2 | 47.8 | 12.0 | 18.0 | 30.0 | 11.5 ^{A,F} | 20.9 ^{A,F} | 7.5 ^{A,F} | 33.6 ^{A,F} | 22.5 |
| 1991 | 4.7 ^{A,F} | 17.0 ^{A,F} | 27.3 ^{A,F} | 46.2 | 18.3 ^{A,F} | 16.1 ^{A,F} | 30.9 ^{A,F} | 15.3 ^{A,F} | 17.0 ^{A,F} | 7.7 ^{A,F} | 35.3 ^{A,F} | 23.8 |
| 1992 | 1.4 ^{A,F} | 26.3 ^{A,F} | 15.8 ^{A,F} | 51.6 ^{A,F} | 17.5 ^{A,F} | 11.5 ^{A,F} | 25.7 ^{A,F} | 14.9 ^{A,F} | 22.2 ^{A,F} | 9.3 ^{A,F} | 37.7 ^{A,F} | 22.9 |
| Change from pre-program year(s) to: | | | | | | | | | | | | |
| Average of program(s) | 29.2 | 9.2 | 4.8 | 7.9 | 5.9 | 0.8 | 17.5 | 3.3 | 5.9 | 2.5 | 23.7 | 8.0 |
| 1992 | -12.5 | 12.8 | 0.6 | 16.3 | 5.5 | -6.5 | 12.7 | 4.8 | 10.3 | 4.5 | 28.7 | 8.5 |

Sources: IMF, International Financial Statistics, various issues; and staff estimates.

Note: Bold indicates a program year. "A" denotes existence of auctions for treasury bills and certificates of deposit. "F" denotes freedom of commercial bank loan and deposit rates.

¹Advanced rapid reformers are defined to include those countries that had both (i) liberalized interest rates and (ii) introduced auctions for short-term government and central bank paper by 1992.

²Annual average; percent a month.

³Excluding Brazil and Argentina.

Table 3-A5. Interest Rates in Slow Reformers with Negative Real Interest Rates at Program Outset¹*(Annual average; percent a year)*

| | Algeria | Haiti | Jordan | Madagascar | Pakistan | Zaire |
|---|--------------|----------------------|-------------------------|-------------------------|-------------------|-------------------------|
| Real interest rates | | | | | | |
| 1986 | -7.0 | 22.5 | 6.6 | — | 2.9 | -17.6 ^F |
| 1987 | 0.1 | 17.3 | 5.8 | -9.8 | — | -32.3 ^F |
| 1988 | -2.8 | 2.8 | -7.3 | 0.5^A | -3.7 | -33.4 ^F |
| 1989 | -5.3 | -1.5 | -15.6 | -0.2 ^A | 0.3 | -7.0^F |
| 1990 | -8.2 | -10.4 ^{E 2} | -2.0^F | 2.7 ^A | -4.7 | -49.9 ^F |
| 1991 | -11.1 | -2.1 ^{E 2} | 2.2 ^F | 1.4 ^A | -1.8 ^A | -94.8 ^F |
| 1992 | -11.7 | -15.9 ^{E 2} | 5.4 ^F | -1.4 ^A | -1.6 ^A | -96.0 ^F |
| Change from pre-program year to: | | | | | | |
| Average of program(s) | -2.9 | -4.3 | -1.5 | 10.3 | -1.7 | 26.4 |
| 1992 | -3.5 | -18.7 | 12.7 | 8.4 | -1.6 | -62.6 |
| Nominal interest rates | | | | | | |
| 1986 | 3.1 | 13.0 | 6.3 | 11.5 | 6.6 | 29.7 ^F |
| 1987 | 5.0 | 11.3 | 6.3 | 15.0 | 6.3 | 29.2 ^F |
| 1988 | 5.0 | 10.0 | 6.3 | 13.5^A | 6.3 | 35.7 ^F |
| 1989 | 6.7 | 10.0 | 7.1 | 12.0 ^A | 6.3 | 49.0^F |
| 1990 | 9.5 | 11.1 ^{E 2} | 8.5^F | 12.0 ^A | 7.3 | 45.8 ^F |
| 1991 | 12.5 | 10.4 ^{E 2} | 8.5 ^F | 13.0 ^A | 7.6 ^A | 45.0 ^F |
| 1992 | 17.0 | 10.0 ^{E 2} | 8.5 ^F | 13.0 ^A | 7.5 ^A | 52.5 ^F |
| Change from pre-program year to: | | | | | | |
| Average of program(s) | 3.0 | — | 1.5 | -1.5 | — | 13.3 |
| 1992 | 7.5 | — | 2.2 | -2.0 | 1.2 | 16.8 |

Sources: IMF, *International Financial Statistics*, various issues; and staff estimates.

Note: Bold indicates a program year. "A" denotes existence of auctions for treasury bills or certificates of deposit. "F" denotes freedom of commercial bank loan and deposit rates (but does not preclude limits on spreads).

¹Countries that had (i) not decontrolled interest rates or (ii) not introduced auctions for short-term government and central bank paper or their equivalent by 1992.²Staff estimate.

Table 3-A6. Interest Rates in Advanced Reformers with Positive Real Interest Rates at Program Outset¹*(Annual average; percent a year)*

| | Guatemala | Jamaica | Mexico | Morocco ² | Papua New Guinea | Philippines | Tunisia ³ | Uruguay | Average |
|--|---------------------------|-------------------------|---------------------------|----------------------|---------------------|---------------------------|--------------------------|----------------------|---------|
| Real interest rates | | | | | | | | | |
| 1986 | -11.6 | 10.6 | -8.3 | 4.0 | 7.6 ^F | 16.0 ^{A,F} | 3.7 | -2.4 ^F | 2.5 |
| 1987 | 2.4 | 10.3 | -17.9 | 6.0 | 6.6 ^F | 3.3 ^{A,F} | 3.5 ^F | 7.5 ^F | 2.7 |
| 1988 | 0.3 | 8.5^A | 10.0 | 6.9 | 4.2 ^F | 4.7 ^{A,F} | 1.7^{A,F} | 3.5 ^F | 5.0 |
| 1989 | -5.6^{A,F} | 1.6^A | 20.0^{A,F} | 3.1 | 6.3 ^F | 3.2^{A,F} | 2.6^{A,F} | 1.4 ^F | 4.1 |
| 1990 | -21.1 ^{A,F} | -2.4 ^{A,F} | 6.0 ^{A,F} | 2.7 ^A | 3.4 ^F | 5.6 ^{A,F} | 3.8 ^{A,F} | -9.9 ^{A,F} | -1.5 |
| 1991 | 8.8 ^{A,F} | -30.2 ^{A,F} | 0.6 ^{A,F} | 2.3 ^A | 5.0 ^{A,F} | 6.2 ^{A,F} | 4.8 ^{A,F} | -4.6 ^{A,F} | -0.9 |
| 1992 | -2.0 ^{A,F} | -3.8 ^{A,F} | 2.2 ^{A,F} | 6.8 ^{A,F} | 5.2 ^{A,F} | 7.2 ^{A,F} | 7.3 ^{A,F} | 2.0 ^{A,F} | 3.1 |
| Change from pre-program year(s) to: | | | | | | | | | |
| Average of program(s) | 5.1 | -15.6 | -2.8 | -1.8 | -2.1 | 0.9 | 0.5 | -8.7 | -4.3 |
| 1992 | -4.4 | -14.1 | -7.8 | 0.8 | -1.1 | 2.5 | 3.8 | 0.6 | -2.5 |
| Nominal interest rates | | | | | | | | | |
| 1986 | 10.2 | 20.9 | 88.1 | 9.0 | 12.3 ^F | 16.1 ^{A,F} | 9.9 | 66.3 ^F | 29.1 |
| 1987 | 11.0 | 18.2 | 103.1 | 8.7 | 10.4 ^F | 11.5 ^{A,F} | 10.0 | 68.5 ^F | 30.2 |
| 1988 | 12.2 | 18.5^A | 69.1 | 8.8 | 10.1 ^F | 14.7 ^{A,F} | 9.2^{A,F} | 74.8 ^F | 27.2 |
| 1989 | 13.0^{A,F} | 19.1^A | 45.0^{A,F} | 9.1 | 10.5 ^F | 18.7^{A,F} | 9.4^{A,F} | 91.5 ^F | 27.0 |
| 1990 | 18.2 ^{A,F} | 26.2 ^{A,F} | 34.8 ^{A,F} | 9.4 ^A | 11.4 ^F | 23.7 ^{A,F} | 11.5 ^{A,F} | 104.4 ^{A,F} | 30.0 |
| 1991 | 24.4 ^{A,F} | 25.6 ^{A,F} | 19.3 ^{A,F} | 9.8 ^A | 10.3 ^{A,F} | 21.5 ^{A,F} | 11.8 ^{A,F} | 72.3 ^{A,F} | 24.4 |
| 1992 | 10.4 ^{A,F} | 34.4 ^{A,F} | 15.6 ^{A,F} | 10.8 ^{A,F} | 8.9 ^{A,F} | 16.0 ^{A,F} | 11.7 ^{A,F} | 62.6 ^{A,F} | 21.3 |
| Change from pre-program year(s) to: | | | | | | | | | |
| Average of program(s) | 1.6 | 6.6 | -40.4 | 0.4 | 0.4 | 5.3 | 0.7 | -3.1 | -3.6 |
| 1992 | -0.6 | 16.2 | -53.5 | 2.1 | -1.6 | 1.3 | 1.7 | -28.9 | -7.9 |

Sources: IMF, *International Financial Statistics*, various issues; and staff estimates.

Note: Bold indicates a program year. "A" denotes existence of auctions for treasury bills or certificates of deposit. "F" denotes freedom of commercial bank loan and deposit rates.

¹Rapid reformers are defined to include those countries that had both (i) liberalized interest rates and (ii) introduced auctions for short-term government and central bank paper by 1992.²Interest rates freed in 1992, but controls on spreads retained.³Interest rates freed in 1987, but controls on spreads retained.

Table 3-A7. Interest Rates in Slow Reformers with Positive Real Interest Rates at Program Outset¹

(Annual average; percent a year)

| | Countries of Bank of Central African States | | | Countries of Central Bank of West African States | | |
|----------------------------------|--|-------|-------|---|------|---------|
| | Cameroon | Congo | Gabon | Côte d'Ivoire | Mali | Average |
| Real interest rates | | | | | | |
| 1986 | 5.4 | 5.8 | 4.8 | 2.2 | 9.2 | 3.4 |
| 1987 | 2.7 | 5.4 | 13.9 | 0.2 | 3.9 | 3.0 |
| 1988 | 8.1 | 4.7 | 18.2 | 5.0 | 5.8 | 7.9 |
| 1989 | 11.3 | 10.1 | 1.9 | 10.2 | 10.0 | 8.6 |
| 1990 | 9.2 | 8.2 | 1.5 | 10.8 | 8.6 | 8.5 |
| 1991 | 9.9 | 5.6 | 13.7 | 8.3 | 14.1 | 9.7 |
| 1992 | 12.5 | 9.0 | 14.6 | 6.4 | 16.6 | 11.9 |
| Change from pre-program year to: | | | | | | |
| Average of program(s) | 7.0 | -3.2 | -16.5 | 5.5 | 4.0 | 1.4 |
| 1992 | 9.8 | -1.1 | -3.6 | 1.4 | 8.0 | 5.3 |
| Nominal interest rates | | | | | | |
| 1986 | 8.5 | 8.5 | 8.5 | 9.3 | 9.3 | 8.8 |
| 1987 | 8.0 | 8.0 | 8.0 | 8.5 | 8.5 | 8.2 |
| 1988 | 9.1 | 9.1 | 9.1 | 8.6 | 8.6 | 8.9 |
| 1989 | 9.8 | 9.8 | 9.8 | 10.1 | 10.1 | 9.9 |
| 1990 | 10.3 | 10.3 | 10.3 | 11.0 | 11.0 | 10.6 |
| 1991 | 10.7 | 10.7 | 10.7 | 11.0 | 11.0 | 10.8 |
| 1992 | 11.2 | 11.2 | 11.2 | 11.8 | 11.8 | 11.4 |
| Change from pre-program year to: | | | | | | |
| Average of program(s) | 2.3 | 2.3 | 2.3 | 2.5 | 2.5 | 2.4 |
| 1992 | 0.9 | 0.9 | 0.9 | 0.8 | 0.8 | 0.9 |

Sources: IMF, *International Financial Statistics*, various issues; and staff estimates.

Note: Bold indicates a program year.

¹Countries that had not (i) decontrolled interest rates or (ii) introduced auctions for short-term government and central bank paper or their equivalent by 1992. All of the countries were members of the CFA franc zone.

Table 3-A8. Interest Rate Spreads: Definitions

Spreads are defined as the difference between lending and deposit rates where these are as defined in *International Financial Statistics (IFS)*, except for the countries listed below, for which the data were obtained from IMF staff estimates.¹

| | Lending Rate | Deposit Rate |
|----------------|---|---|
| Algeria | Maximum medium-term industrial loans | Maximum 3–6 month deposit rate |
| Czechoslovakia | Credits to enterprises | IFS to 1990, average rate thereafter |
| Ecuador | General operations and other loans | 30–89 days |
| Egypt | Maximum to 1990, average thereafter | Three-month rate |
| Hungary | Loans of less than one year | Deposits of less than one year |
| Jordan | Maximum loan rate | One-year time deposit |
| Madagascar | High-risk loan rate to 1989, maximum rate thereafter | Six-year deposit rate to 1989, maximum rate thereafter |
| Pakistan | Minimum investment rate (Profit and Loss System) | Savings account rate (Profit and Loss System) |
| Romania | Overdraft rate to 1990, then upper end of range of loan rates | Average deposit rate to 1990, then upper end of deposit rates |
| Venezuela | Average lending rate | IFS |
| Zaire | Medium-term credit to industry | One-year deposit rate |

¹Data were either unavailable or unsuitable for Argentina, Brazil, Mexico, and Yugoslavia. Spreads are defined as $\left(\frac{1 + (r^l/100)}{1 + (r^d/100)} - 1 \right) \times 100$, where r^l and r^d are the lending and deposit interest rates, respectively. This definition is designed to remove the distorting effects of high inflation and high nominal interest rates from the calculation of spreads.