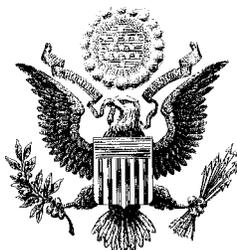


# **FEATURES AND POLICY IMPLICATIONS OF RECENT CURRENCY CRISES**



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United States Congress**

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## **Summary**

Major currency crises have been frequent in the last ten years. This report describes what currency crises are, why they are important, what features recent major currency crises have shared, and what the implications are for U.S. participation in international monetary affairs.

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# FEATURES AND POLICY IMPLICATIONS OF RECENT CURRENCY CRISES

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## FEATURES AND POLICY IMPLICATIONS OF RECENT CURRENCY CRISES

The last ten years have seen no fewer than eight currency crises that deserve to be called major, because they have affected several countries together or one of the larger emerging-market countries. Crises have occurred in the following areas of the world:

- The European Monetary System (EMS) and countries shadowing it, 1992-3 (Belgium, Denmark, Finland, France, Ireland, Italy, Luxembourg, Norway, Portugal, Spain, Sweden, and the United Kingdom; Germany and the Netherlands were also affected to a lesser extent).
- Africa's CFA franc zone, 1993-4 (Benin, Burkina Faso, Cameroon, Central African Republic, Comoros, Chad, Congo-Brazzaville, Côte d'Ivoire, Equatorial Guinea, Gabon, Mali, Niger, Senegal, and Togo).
- Mexico, 1994-5 (the so-called tequila crisis, which spilled over to Argentina).
- East Asia, 1997-8 (affecting mainly Indonesia, South Korea, Malaysia, and Thailand; China, Hong Kong, the Philippines, Singapore, Taiwan, and Vietnam were also affected to a lesser extent).
- Russia, 1998.
- Brazil, 1999.
- Turkey, 2001.
- Argentina, 2001 (a continuing, slow-motion crisis that has spilled over to Brazil).

Figure 1, on the next page, shows the crisis countries. Readers interested in more detail will find a capsule summary of each crisis in the Appendix. There have also been many smaller crises that have affected individual countries but have posed little risk of spreading. One recent study of 56 developed and developing countries identifies 68 crisis episodes from 1992 to 1998; another study, of 90 developing countries, identifies 51 crisis episodes over the same period; a third study, of 90 developed and developing countries, counts 49 crisis episodes over the shorter period 1992 to 1997.<sup>1</sup>

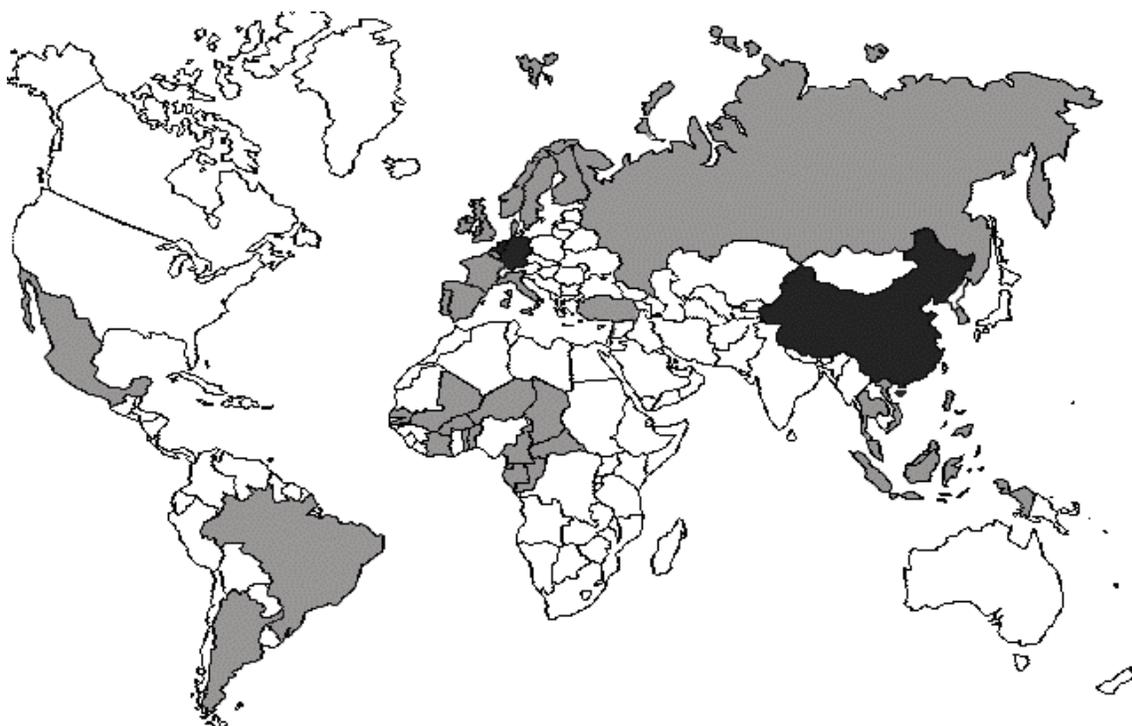
This report describes what currency crises are; why they are important; what features major recent currency crises have shared; and what the implications are for U.S. monetary policy and U.S. participation in international efforts to prevent currency crises.

### I. BASIC QUESTIONS ABOUT CURRENCY CRISES

**What is a currency crisis?** A currency crisis is a situation in which a currency experiences heavy selling pressure, also called exchange market pressure or a speculative attack. Typically, currency crises are discussed in the context of a constant exchange rate.

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<sup>1</sup> Bordo and others (2001), Web data set table D; Leblang (2000), pp. 3, 38-9, 51-2; Glick and Hutchison (2001), pp. 64-7. These studies count a common crisis affecting, say, four countries as four episodes of crisis. They consider periods stretching back well before 1992, but since the emphasis of this paper is on recent currency crises, only their data for recent years is mentioned.

**Figure 1. Countries affected by major currency crises in the last ten years**

*Notes: Light shading* denotes countries that were affected by crises and devalued. *Dark shading* denotes countries that were affected but did not devalue. Argentina's recent introduction of a dual exchange rate is counted as a devaluation. Many other countries were affected by minor crises not shown here. Map used by permission of [www.theodora.com/maps](http://www.theodora.com/maps).

Suppose the national currency is called the doubloon, and suppose it initially has an exchange rate of one per U.S. dollar. Selling pressure reflects concern that the doubloon may be devalued. Currency crises can also happen in the context of a floating exchange rate, in which the central bank maintains no particular exchange rate. In that case, selling pressure reflects concern that the currency will depreciate faster than previously expected. One indication of selling pressure are substantial losses in the foreign reserves held by a country's *monetary authority*—the central bank or other body that makes monetary policy, including issuing the local currency. Other indications are a rise in short-term interest rates; depreciating forward exchange rates; or a depreciating black-market exchange rate, if a black market in the currency exists.<sup>2</sup> (*Foreign reserves* are bank accounts, bonds, and other assets denominated in foreign currency. To buy their own currency in the foreign-exchange market, central banks sell foreign reserves. For

<sup>2</sup> Einzig (1970), pp. 8-10; Bordo and others (2001), p. 55. Some researchers have defined the signs of selling pressure numerically, for example as including a fall in foreign reserves of more than 25 percent since the previous period; other researchers have defined the signs more impressionistically. See Kaminsky and others (1998), p. 7.

some purposes, central banks also use gold and silver as foreign reserves. *Forward exchange* is an agreement to trade currencies on a future date at an exchange rate specified in advance. A *black market* for currency is an unofficial market that exists in some countries where governments restrict the buying and selling of foreign currency in the official market. Typically, a unit of local currency buys less foreign currency in the black market than in the official market.)

A currency crisis is resolved when selling pressure ends. One way to end pressure is to devalue, that is, establish a new exchange rate at a sufficiently depreciated level. The central bank issuing the doubloon in the example above might cease exchanging doubloons at the previous level of one per U.S. dollar and set a new level of 1.5 per dollar. Another way to end selling pressure is to allow a floating exchange rate. Floating allows the exchange rate to “find its own level,” which is almost always depreciated compared the previous pegged rate (that is, it takes more doubloons to buy a dollar). Devaluing and allowing depreciation make foreign currency and foreign goods more expensive in terms of domestic currency, which tends to reduce demand for foreign currency, ending the imbalance that caused selling pressure. However, in some cases, particularly when confidence in the currency is low, the crisis continues, and further rounds of devaluation or depreciation occur.

Currency crises that end in devaluations or accelerated depreciations are sometimes called currency crashes. Not all crises end in crashes. A way of trying to end the selling pressure of a crisis without suffering a crash is to impose exchange controls, that is, restrict the ability of people to buy and sell foreign currency. However, exchange controls create profit opportunities for people who discover how to evade them, so over time controls lose effectiveness unless enforced by an intrusive bureaucracy. Yet another way to end selling pressure is to obtain a loan to bolster the foreign reserves of the monetary authority. Countries that wish to bolster their foreign reserves often ask the International Monetary Fund (IMF) for loans. Like exchange controls, a loan of foreign reserves can help temporarily, but may just delay rather than end selling pressure. The final way to end selling pressure is to restore confidence in the existing exchange rate, such as by announcing appropriate and credible changes in monetary policy.

Often currency crises occur in connection with bank failures, political turmoil, or other problems. Sometimes, though, they seem to arise almost out of nowhere and end with little effect outside the foreign-exchange market. The United Kingdom ceased maintaining a constant exchange rate of the pound sterling to the German mark in September 1992, during the crisis of the European Monetary System. Soon afterwards, the economy of the United Kingdom began growing, ending a recession that had lasted two years. The crisis had no effect on the financial system or on government finances. Similarly, a country’s banking system or the stock market can experience problems without creating a currency crisis: Japan has longstanding problems with its banks, and the Nikkei stock market index recently fell to less than a quarter of its peak level of 1989, but the yen has not suffered a crisis.

Occasionally, countries change their exchange rate arrangements without having recently experienced selling pressure. Such changes are outside the scope of this paper because they are not true currency crises.

**Why are currency crises important?** Currency crises can create large economic losses. The 56-country study mentioned previously found that the average loss of output during currency crises from 1993 to 1997 was 5.9 percent of gross domestic product (GDP)—equal to one to two years of economic growth for most countries. (A loss of output of 5.9 percent means that if the average rate of growth was 6 percent, growth fell to 0.1 percent, not to -5.9 percent.) During “twin crises”—currency crises combined with banking crises—the average loss of output was a staggering 18.6 percent of GDP.<sup>3</sup> A crisis-prone currency can derail economic growth; a crisis-free currency is a powerful agent of economic stability, though it is not by itself sufficient to ensure growth.

The U.S. dollar has experienced nothing resembling a currency crisis since 1985-86, when its floating exchange rate depreciated by roughly one-third against other major currencies over twelve months. However, because international financial markets are becoming ever more closely linked through flows of investment, major crises in other currencies can affect the U.S. economy. The Federal Reserve System believed that the fallout from Russia’s August 1998 currency crisis threatened to create a credit crunch in the United States.<sup>4</sup> The Fed responded over the next few months by cutting its discount rate from 5 percent to 4.5 percent to reduce the possibility of a recession. The Federal Reserve Bank of New York arranged for the rescue of Long Term Capital Management, a hedge fund pushed to the edge of bankruptcy by the Russian crisis.

**Have currency crises become more frequent or severe in recent years?** No complete list of currency crises exists, but what evidence has been collected suggests currency crises have become more frequent since 1973, when the major international currencies began to have floating exchange rates with one another.<sup>5</sup> The study of 56 countries found that since 1973, simple currency crises plus twin currency and banking crises have been more frequent than in any period since data began in 1880. For a developed country, the chance of suffering a currency crisis or twin crisis in any given year from 1973 to 1997 was about 1 in 10, while for a developing country the chance was about 1 in 4. (Developing countries are those where gross domestic product [GDP] per person is less than about one-third of the U.S. level, which is currently \$36,000). Subdividing the period, since 1988 simple currency crises have been less frequent but twin crises have been more frequent.

So much for the *frequency* of currency crises. What about their *severity*, as measured by the length and depth of the average crisis? Over the long run of more than a

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<sup>3</sup> Bordo and others (2001), p. 59, Table 1.

<sup>4</sup> Federal Reserve System (1999), pp. 24-6, 109-11.

<sup>5</sup> The major international currencies are the U.S. dollar, euro, Japanese yen, British pound, Swiss franc, and perhaps the Canadian dollar and Australian dollar. Before the euro replaced them, the German mark, French franc, and to a lesser extent the Italian lira were also among the major international currencies. The major currencies account for more than 90 percent of daily volume in foreign-exchange markets. BIS (1999), p. 9, Table B-3.

century, it has changed little, but over the medium run of decades, it has changed noticeably. Twin crises have been much deeper since 1973 than they were from 1945 to 1971, when exchange rates were pegged under the Bretton Woods gold exchange standard.<sup>6</sup> A possible explanation for the greater severity of twin crises in recent decades is that as more and more countries have opened their economies to foreign investment, the range of investment opportunities available to their citizens has increased, reducing the monopoly profits their financial systems formerly enjoyed and punishing weak financial institutions more.

## II. SOME BASICS OF MONETARY SYSTEMS

Two features of monetary systems that affect whether and how currency crises occur are the exchange rate arrangement and the monetary authority. The exchange rate arrangement is whether the value of a currency is determined by reference to another currency or a commodity as some kind of anchor. The anchor may be loose or tight, and may be a basket rather than a single currency or commodity. The monetary authority, to repeat, is the body that makes monetary policy (including issuing the local currency) and hence affects the exchange rate.

**Exchange rate arrangements.** There are three broad categories of exchange rate flexibility: floating rates; various intermediate arrangements, which here will all be termed pegged rates; and fixed rates.<sup>7</sup> The three categories are easiest to distinguish when no exchange controls restrict the buying and selling of foreign currency; where controls exist, an exchange rate that is officially of one type can work in practice like another type.

Under a *floating* exchange rate, the exchange rate is not maintained constant in terms of any anchor currency. The purest type of floating exchange rate is an unmanaged (“clean”) float, where the monetary authority never buys or sells foreign currency in an attempt to influence exchange rates. A floating exchange rate where the monetary authority often buys or sells foreign currency to influence exchange rates is called a managed (“dirty”) float. The U.S. dollar is an example of a currency with a fairly unmanaged float: the Federal Reserve, working with the Treasury, usually tries to influence exchange rates only once or twice a year. The Brazilian *real*, on the other hand, has a highly managed float: the Central Bank of Brazil has in recent months tried to influence exchange rates daily at times.

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<sup>6</sup> Bordo and others (2001), pp. 56-9 and Web appendix.

<sup>7</sup> Economists still lack a generally agreed set of terms and classifications for exchange rates. Some economists do not distinguish between fixed and pegged rates, reducing the broad categories of flexibility to two: fixed or pegged on the one hand, and floating on the other hand. Other economists use the terms “super fixed” and “fixed,” “pegged” and “intermediate,” or “hard pegged” and “soft pegged,” to signify the difference between what this paper calls fixed rates and pegged rates. The terms and classifications here are chosen because they seem clearest and most useful for understanding the connection between exchange rate arrangements and currency crises.

In popular usage, an exchange rate is often called pegged if it has persisted only a short while, and fixed once it has persisted longer. This study distinguishes between pegged and fixed exchange rates based on how they work, not how long they have existed.

Under a *fixed* exchange rate, a currency is maintained constant in terms of an “anchor” currency. Today, all countries that have fixed or pegged exchange rates use a foreign currency or basket of currencies as the anchor, but in the past, gold, silver, and other commodities have also served as anchors. Under a fixed exchange rate, the monetary authority, if any, has no discretionary power to vary the *monetary base*. (The monetary base is the type of money accepted as final payment in the local financial system. Typically, it comprises notes [paper money] and coins of the monetary authority, plus deposits at the monetary authority that banks use as reserves.) Under a fixed exchange rate, the monetary base changes only in response to changes in demand by the public. An example of a country with a fixed rate is Panama, which uses U.S. dollars as currency and has no truly separate monetary authority of its own.

Under a *pegged* exchange rate, the fluctuation of the currency is maintained within limits for the time being, but may not remain within the limits. A pegged exchange rate can range from a publicly announced “hard” peg that is maintained constant in terms of an anchor currency to a “crawling” or “soft” peg that may not even be publicly announced and has a wide, and perhaps moving, band of fluctuation. The Malaysian ringgit is an example of a currency with a hard pegged rate: its current exchange rate is 3.8 per dollar, but there has been talk that it will be devalued to perhaps 4.2 per dollar.

Unlike a fixed rate or a clean floating rate, a pegged rate has scope for *sterilized intervention*, also called monetary sterilization. Sterilized intervention occurs when the central bank offsets its dealings in the foreign-exchange market with dealings in domestic securities that leave the monetary base unchanged. Consider the hypothetical doubloon currency discussed earlier, which initially has a constant exchange rate of one per dollar. Suppose the monetary authority has issued 10 billion doubloons, and that it initially has \$10 billion in foreign reserves, making its reserves 100 percent of doubloons issued. If people wish to exchange 2 billion doubloons for dollars, without sterilized intervention the monetary authority’s issue of doubloons would fall to 8 billion and its foreign reserves would fall to \$8 billion, preserving the reserve ratio of 100 percent. With fully sterilized intervention, the monetary authority buys 2 billion doubloons of domestic assets (for example, government bonds), pushing its issue of doubloons from 8 billion back up to 10 billion. It has gained no new foreign reserves, so its reserve ratio falls from 100 percent to 80 percent.

Under a fixed exchange rate, the monetary authority, if any, would only issue doubloons 100 percent backed by dollars or other foreign reserves.<sup>8</sup> If all holders of its doubloons wished to exchange them for dollars at the fixed rate, the monetary authority could satisfy them. Under an unmanaged floating rate, the monetary authority would not need to hold any dollars, because holders of doubloons would have no right or expectation of exchanging them for dollars at a specified rate. Neither under a fixed rate

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<sup>8</sup> It is possible to have a fixed exchange rate maintained by a monetary authority that holds 100 percent dollar reserves at the margin, that is, only for doubloons beyond a certain core amount always expected to remain in circulation. The problem with such an arrangement is that the core may shrink, in extreme cases to zero.

nor an unmanaged floating rate does sterilized intervention occur. Sterilized intervention under a pegged rate enables the monetary authority to reduce the reserve ratio below 100 percent, creating the possibility that if many people suddenly want to exchange doubloons for dollars, the monetary authority may not have enough dollars to satisfy them all.

**Monetary authorities.** The most common type of monetary authority today is a national central bank, such as the Federal Reserve or the Bank of Mexico. More than 100 countries have national central banks. A *central bank* is a monopoly issuer of the monetary base that has substantial discretionary power in the main aspects of monetary policy: setting the quantity of the monetary base and determining the exchange rate.

People usually think of national central banks as the norm in monetary authorities, but there are many countries that have other arrangements. Thirty-four countries belong to central banks that are multinational rather than national; the most prominent example of such an institution is the European Central Bank, which issues the euro.<sup>9</sup> A multinational central bank is like a national central bank, except that its currency is used as local currency in more than one country and its directors are drawn from more than one country.

Thirteen territories have currency boards or currency board-like systems. A *currency board* is typically a monopoly issue of the monetary base that issues currency in a rule-bound manner with no discretion. The rules that bind an orthodox currency board are a fixed exchange rate with an anchor currency and a requirement to hold 100 percent foreign reserves against its monetary liabilities. A *currency board-like system* allows the monetary authority an element of discretion in monetary policy that an orthodox currency board lacks. Discretion typically comes through departing from a strict requirement of 100 percent reserves, thereby allowing sterilized intervention to make the reserve ratio lower or higher. In Argentina, for example, the minimum foreign reserve requirement is 90 percent and there is no maximum; as of late October 2001, the central bank had foreign assets of about 19 billion pesos and monetary liabilities of about 16 billion pesos.<sup>10</sup>

Thirty-three territories are officially dollarized. *Official dollarization* is the use of a foreign currency to largely or fully replace national currency as the monetary base. “Dollarization” is sometimes used to apply specifically to the U.S. dollar, other times more generally to the use of any foreign currency.

Nine French overseas administrative units plus the Chinese special administrative region of Macao have *monetary institutes*, monetary authorities with more discretionary power than currency boards but less than central banks.

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<sup>9</sup> Member countries of the European Central Bank at present have distinct national currencies that circulate as, in effect, subdivisions of the euro. Euro notes and coins will enter into circulation to replace the national currencies beginning in January 2002.

<sup>10</sup> Banco Central de la República Argentina, Web site, <<http://www.bcra.gov.ar/pdfs/contad/pasinu.pdf>>. The figure for foreign assets excludes Argentine government bonds.

<b>Table 1. Countries with monetary authorities other than national central banks</b>	
<i>Monetary authority</i>	<i>Countries</i>
Multinational central bank	Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain (European Central Bank); Anguilla*, Antigua and Barbuda, Dominica, Grenada, Montserrat*, St. Kitts and Nevis, St. Lucia, St. Vincent and The Grenadines (Eastern Caribbean Central Bank); Cameroon, Central African Republic, Chad, Congo-Brazzaville, Equatorial Guinea, Gabon (Banque des États de l’Afrique Centrale); Benin, Burkina Faso, Côte d’Ivoire, Guinea-Bissau, Mali, Niger, Senegal, Togo (Banque Centrale des États de l’Afrique de l’Ouest)
Currency board	Bermuda*, Cayman Islands*, Falkland Islands*, Faroe Islands*, Gibraltar*
Currency board-like system	Argentina, Bosnia and Herzegovina, Brunei, Bulgaria, Djibouti, Estonia, Hong Kong*, Lithuania
Official dollarization	American Samoa*, Andorra, British Virgin Islands*, Cocos (Keeling) Islands*, East Timor, Ecuador, El Salvador, Greenland*, Guam*, Kiribati, Kosovo**, Liechtenstein, Marshall Islands, Micronesia, Monaco, Montenegro**, Nauru, Niue*, Norfolk Island*, Northern Cyprus**, Northern Mariana Islands*, Palau, Panama, Pitcairn Island*, Puerto Rico*, St. Helena*, San Marino, South Georgia and South Sandwich Islands*, Tokelau*, Turks and Caicos Islands*, Tuvalu, U.S. Virgin Islands*, Vatican City
Monetary institute	French Guiana*, French Polynesia*, Guadeloupe, Macao*, Martinique*, Mayotte*, New Caledonia*, Réunion*, St.-Pierre and Miquelon*, Wallis and Futuna*
Government treasury issue	Channel Islands*, Cook Islands*, Isle of Man* (all also officially dollarized in part)
<i>Notes: *Dependency. **Not internationally recognized as independent.</i>	

*Government treasury issue* was once widespread; for instance, the U.S. Treasury Department issued notes (paper money) from 1861 to 1914, and at the time they comprised the bulk of notes that Americans used. However, almost all countries that once had government treasury issue have replaced it with central banking; the United States did so in 1914, when the Federal Reserve System began operations. Government treasury issue exists today only in three small territories, all of which also allow circulation of a foreign currency as official currency.

These are the types of monetary authorities in existence today. There are also other types that are no longer in use.<sup>11</sup>

**The connection between exchange rate arrangements and monetary authorities.** Not all types of monetary authorities are intended to maintain or are capable of maintaining all types of exchange rate arrangements. Currency boards and dollarization are explicitly intended to maintain fixed exchange rates. A currency board has rules that eliminate the discretionary power of the monetary authority to vary the exchange rate or the quantity of the monetary base. Dollarization eliminates the national monetary authority entirely. A multinational central bank substitutes a single international monetary authority for multiple national monetary authorities, establishing a single monetary policy and fixed exchange rates among its member countries (similar to what exists among the states of the United States). In relation to *nonmember* countries, multinational central banks and national central banks alike are inherently pegged or floating exchange rate arrangements. They are explicitly designed to have at least some discretionary power over the quantity of the monetary base.<sup>12</sup> Currency board-like systems have exchange rates that might be termed nearly fixed, with possibly incompatible elements of pegging.

### III. FEATURES OF RECENT MAJOR CURRENCY CRISES

Since the East Asian crisis, economists have extensively researched the features of currency crises, to understand why past crises happened and to search for indicators predicting future crises. Table 2, on the next page, lists more than 30 features that have been proposed as worth investigating, and shows which have been present during the major currency crises of the last ten years. Other features could be considered, but the table includes the most widely studied ones.<sup>13</sup> The features fall into several broad categories.

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<sup>11</sup> On currency boards, see Hanke and Schuler (1994); on dollarization, see Schuler (2000). Of monetary systems that no longer exist, the one most studied by economists in recent years has been *free banking*, a system of unfettered competition in supplying the monetary base and all forms of bank credit, including bank notes; see Selgin and White (1994).

<sup>12</sup> If the monetary base were on autopilot, so that it increased at a constant rate—possibly zero—monetary policy could be operated by a printing bureau and would not require a central bank. Milton Friedman (1988 [1984], p. 421) has suggested this possibility.

<sup>13</sup> Kaminsky and others (1998, pp. 25-45) survey 28 studies and a total of 105 features the studies propose as possible indicators of currency crises. See also Aziz and others (2000) for a description of common elements among currency crises in 50 countries from 1975 to 1997.

<b>Table 2. Features of major currency crises in the last ten years</b>								
	<b>EMS (9/92- 8/93)</b>	<b>CFA (8/93- 1/94)</b>	<b>Mexico (12/94- 1995)</b>	<b>E Asia (7/97- 1998)</b>	<b>Russia (8/98)</b>	<b>Brazil (1/99)</b>	<b>Turkey (2/01)</b>	<b>Argen- -tina (2001)</b>
<b>Monetary policy</b>								
Central bank	√	√	√	√(1)	√	√	√	(4)
“Pegged” exchange rate	√	√	√	√(1)	√	√	√	(4)
M2 or M3 growth >20%				some	√		√	
Falling reserves/M2	?	some				√	√	
Appreciating real ex. rate	some		√	√	√		√	
Inflation (CPI) >5%	some		√	some	√	(3)	√	
Some capital controls		√	√	√(1)	√	√	√	
Crises in last 10 years	some		√	some	√	√	√	√
<b>Government finance</b>								
Govt. deficit >2% GDP	most	some			√	√	√	√
Govt. debt >50% GDP	some	some		some		√	√	√
Short-term debt > reserves		some	√	(2)	√	√	√	√
Foreign debt >25% GDP		√	√	most	√	√	√	√
<b>Financial system</b>								
Banks or supervision weak	some	√	√	most	√		√	
Foreign banks restricted		?	√	√	√		√	
Liberalized in last 10 years	some	?	√	some	√	√		√
<b>Overall economy</b>								
Falling GNP growth/head	some	most	√			√	√	√
Rising unemployment rate	some	?	slightly		√	√		
Falling stock market	some	?		some				
Falling export growth	most	most		most		√	√	
Trade > 60% GDP	some			most				
Savings rate <15% GDP		most						
Capital inflows >5% GDP		√	√	most			√	√
Curr. acct. def. >5% GDP		most		some				
Worsening terms of trade	some	most				√	√	
Domestic interest rates up	some							√
Real interest rates >10%	some	√	√		√	√		√
<b>External factors</b>								
Recent crisis elsewhere					√Asia	√Russ.		√Turk.
World interest rate up >2%			√					
Other big external shocks								
<b>Political factors</b>								
Developing countries		√	√	most	√	√	√	√
Recent election or turmoil	some		√	some		√	minor	
<p><i>Notes:</i> EMS = European Monetary System; CFA = Africa’s CFA franc zone. Statistics are from annual data; more frequent data shortly before crises yield different results in some cases. √ means yes; blank means no; ? means not available. (1) Except Hong Kong, which had a currency board-like system with a more nearly fixed exchange rate. (2) Only Indonesia and South Korea. (3) Low inflation 1998, but higher inflation before. (4) Currency board-like system with more nearly fixed exchange rate.</p> <p><i>Sources:</i> World Bank (1999); IMF (various dates) and country reports from IMF Web site, &lt;<a href="http://www.imf.org">http://www.imf.org</a>&gt;; BIS (2001); news reports.</p>								

**Monetary policy.** All the major currency crises of the last ten years began and were worst in countries with central banks that maintained pegged exchange rates. (Argentina at present has a currency board-like system operated by the Central Bank of the Argentine Republic, and its exchange rate has elements of a peg.)

A classic currency crisis is brought on by rapid growth in the money supply that results in rising inflation and an appreciating real exchange rate (a measure of the competitiveness of exports<sup>14</sup>). People exchange local currency for more stable foreign currency, causing a fall in the central bank's ratio of foreign reserves to its the local currency has issued. Many of the major recent currency crises fit this classic pattern, but others do not: most of the countries involved in the crisis of the European Monetary System in 1992-3 had had inflation below 5 percent a year for five or more years.

According to some observers, *capital controls*—exchange controls that apply to buying and selling foreign financial assets—should help make currency crises less frequent, because they give some ability to reduce speculative movements of funds. According to other observers, capital controls can make currency crises more likely by making people trust the currencies less. The existence of capital controls did not prevent any of the recent major crises, though they helped insulate China from the East Asian crisis and may have helped Malaysia recover from the crisis.<sup>15</sup>

Some countries have been more prone to currency crises than others because of their monetary policy or political instability. Their history influences perceptions in financial markets. Many of the countries that suffered the major currency crises of the last ten years had also suffered major or minor crises in the previous ten years. However, others had not: until 1994 the members of Africa's CFA franc zone had *never* devalued against their anchor currency, the French franc, in the more than 100 years the CFA franc and its predecessors had existed.<sup>16</sup>

**Government finance.** The underlying cause of a classic currency crisis is often the finances of the government. If the government cannot easily finance its budget deficits by raising taxes or borrowing, it may pressure the central bank to finance them. It may also pressure the central bank to finance so-called quasi-fiscal deficits that result from off-budget spending by government-owned companies or autonomous government bodies such as social security funds. Many central banks lack the political independence to resist pressure. Financing government deficits by creating money can increase the

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<sup>14</sup> More generally, the real exchange rate is a summary measure of the prices of goods and services in one country compared to another. There are different ways to measure the real exchange rate; here is a simple example of one way. Suppose that a year ago, the basket of goods that the average U.S. household bought cost \$100 a day, and the somewhat different basket of goods that the average Japanese household bought cost the equivalent of \$100 in Japanese yen. Now suppose that today the U.S. basket still costs \$100, but the Japanese basket only costs \$95 because prices in yen have fallen or because the yen has depreciated against the dollar. Japan's real exchange rate with the United States has depreciated 5 percent over the year. An implication is that the cost of producing goods in Japan should have fallen relative to the cost of producing competing goods in the United States.

<sup>15</sup> For a discussion of recent experience with capital controls, see Ariyoshi and others (2000).

<sup>16</sup> The CFA franc was revalued (increased in value) against the French franc in 1945 and again in 1948.

supply of money faster than the demand is growing, thereby causing inflation. Brazil is a case in point. From 1994 to 1998 it had budget deficits of 6 to 8 percent of GDP. They were financed in part by the central bank, whose liabilities in excess of foreign reserves rose about 25 percent a year. By comparison, total liabilities of the Federal Reserve System in excess of foreign reserves rose only about 2 percent a year over the same period.<sup>17</sup>

The finances of the government can also cause trouble if the budget is in surplus this year but the government has accumulated large debts from previous years. If lenders become unwilling to make new loans, the government may become unable to repay its old loans. Short-term debt is especially vulnerable to such problems because it has to be refinanced frequently. Unfavorable events may disrupt refinancing, as happened to Mexico in late 1994. The government may then pressure the central bank to create money or hand over foreign reserves if, as is the case in many developing countries, some of the loans are payable in foreign currency.

**Financial system.** A weak financial system can trigger a currency crisis if the problems of financial institutions cause changes in monetary policy that increase the chance of devaluation. Governments in most countries explicitly or implicitly guarantee bank deposits, but often cannot fully finance large rescues of financial institutions through the noninflationary means of tapping previously established deposit insurance funds, diverting money from the current government budget, or issuing bonds that financial markets are willing to accept. Hence they pressure their central banks to finance the rescues by drawing down foreign reserves, or even through inflation. People become apprehensive about the future value of the local currency and sell local currency to obtain more stable foreign currencies. Turkey's currency crisis of November and December 2000 was precipitated by its rescue of several banks. Turkey obtained a loan from the IMF, which enabled it to delay devaluation until a fresh currency crisis triggered by political events in February 2001.

Some of the major currency crises of the last ten years have occurred in countries that had recently liberalized their financial systems. In finance, as in other types of economic activity, there has been a worldwide trend in recent years toward deregulation. Many governments formerly used financial regulations to direct investment into politically favored channels. In return, they restricted competition among financial institutions: banks, life insurance companies, mutual funds, and stockbrokers could not encroach on each other's territory, nor could foreign institutions encroach on domestic institutions. Profits from restricted competition subsidized unprofitable government-directed investments. Deregulation changed the picture by reducing government direction of investments and allowing more competition among institutions. However, governments often failed to extend deregulation to its logical conclusion or to make appropriate changes in their own policies toward newly deregulated financial institutions. They allowed competition among locally owned institutions but failed to allow competition from foreign institutions, which were larger and more experienced with deregulation. They also failed to ensure that in the new environment of greater freedom

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<sup>17</sup> IMF (various dates).

to reap the rewards of success, financial institutions also bore greater responsibility for failure. As a result, financial institutions made mistakes in the unfamiliar environment of deregulation, failed, and were rescued at public expense.

**Overall economy.** A weak economy can trigger a currency crisis by creating doubt about the determination of the government and the central bank to continue with the current monetary policy if weakness continues. Features of a weak economy include falling GDP growth per person, a rising unemployment rate, a falling stock market, and falling export growth. The countries of Africa's CFA franc zone had weak economies before they devalued in January 1994. Economies that are more open to trade also tend to be more open to foreign disturbances. Extensive dependence on foreign investment to supplement domestic savings can also be a source of trouble if the flows of foreign investment are likely to dry up or reverse suddenly, weakening the economy substantially. Worsening terms of trade (lower prices for exports or higher prices for imports) are another possible signal of a weak economy. Rising domestic interest rates or high real (inflation-adjusted) interest rates can also cause trouble, because they may trigger waves of bankruptcy.

**External factors.** An increase in world interest rates (meaning rates in the major international currencies) can trigger a currency crisis if a central bank resists increasing the interest rates it charges. Funds may flow out of local currency into foreign currency, reducing the central bank's ratio of foreign reserves to domestic currency (if the exchange rate is pegged) or accelerating the depreciation of the exchange rate (if the rate is floating). A big external shock that weakens the economy, such as war or a jump in the price of imported oil, can likewise trigger a currency crisis. External shocks have been the key features in many currency crises historically, such as the general abandonment of the gold standard during the two world wars, but have been notably absent in the major crises of the last ten years.

**Political factors.** The only major currency crisis of the last ten years that has occurred in developed countries was that of the European Monetary System in 1992-3. All the other crises have occurred in developing countries.<sup>18</sup> Developing countries have historically been more prone to currency crises than developed countries because they tend to have a weaker rule of law, governments more prone to overthrow by force, central banks that are not politically independent, and other characteristics that create political uncertainty about monetary policy.<sup>19</sup> Over the last ten years, developing countries have also more frequently maintained pegged exchange rates, whereas since the crisis of the European Monetary System, all large developed countries have maintained fixed or floating rates. (Countries belonging to the European Central Bank have had fixed rates since January 1999, when they introduced the euro as their common currency.)

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<sup>18</sup> The East Asian currency crisis affected Hong Kong, Singapore, and Taiwan, which are developed countries, but the main countries affected were Indonesia, Malaysia, the Philippines, and Thailand—all developing countries—plus South Korea, which had only quite recently become rich enough to qualify as a developed country. China and Vietnam were also affected, to a lesser extent.

<sup>19</sup> Gwartney and others (2001) measure the extent to which 123 countries have the rule of law and other characteristics that promote economic growth.

Especially if the exchange rate is pegged, governments are sometimes tempted to delay devaluation until after an upcoming election, to prevent opposition parties from making a recent devaluation a campaign issue. Mexico in 1994 and Brazil in 1999 both suffered their currency crises and devalued soon after presidential elections. However, none of the countries that suffered the major currency crises of the last ten years were experiencing grave political turmoil, such as the prospect of the government being overthrown, when the crises began. Mexico had suffered high-profile political assassinations earlier in 1994 and was experiencing a small, armed uprising in the remote province of Chiapas, but the existence of the Mexican government was not in danger.

#### **IV. PROBLEMS WITH PEGGED EXCHANGE RATES**

Comparing the major currency crises of Table 2, what stands out is the lack of common features. *The only feature common to all cases is central banks maintaining pegged exchange rates.* Another feature that is widespread but not universal is that since 1993, almost all the countries that have suffered crises have been developing countries. Beyond that, it is difficult to make any generalizations. Some of the affected countries are large in terms of population or economy; others are small. They have different cultures and political systems. Some countries had rapid growth in the money supply, government budget deficits, and other classic warnings of impending crisis; others did not. Some countries had weak financial systems; others, such as Britain and France in 1992-3 and Hong Kong in 1997-8, had very strong systems. Some countries had weakening economies and high dependence on foreign investment; others did not. There were no external or political factors common to all crises. Nor do there seem to be any features omitted from Table 2 that are common to all the major currency crises of the last ten years, let alone to the many minor crises of the same period.

Both central banking and pegged exchange rates were common to all the recent major currency crises. So, what allowed the crises to happen: central banking alone, pegged exchange rates alone, or the combination of the two? *Experience strongly suggests that it was pegged exchange rates alone.* At the same time that many countries with pegged exchange rates were suffering currency crises, other countries without pegged rates avoided crises. As has been mentioned, the United States has experienced nothing resembling a currency crisis since 1985-86, nor has Japan despite its current economic problems, nor has Britain since abandoning a pegged exchange rate in 1992, nor have many other countries that could be named. What all of them have in common is that their central banks maintain fairly “clean” floating exchange rates and have credible procedures for keeping inflation low. Other countries have avoided currency crises by going to the other extreme in exchange rate arrangements, having monetary arrangements that provided them with solid fixed exchange rates. The extreme case of such arrangements is dollarization, which involves adopting another country’s currency as local currency.

Why do pegged exchange rates create such trouble? Their defining characteristic of sterilized intervention, which was discussed above, means that central banks or other

monetary authorities maintaining pegged rates can encounter problems of a type that do not occur under floating rates or fixed rates. A monetary authority maintaining a pegged rate tries to keep the exchange rate at a particular level, but it has the freedom to run down its foreign reserves until they are exhausted. Typically, no law or other restraint compels monetary authorities maintaining pegged rates to maintain any particular relation between their foreign reserves and the monetary base. In contrast, under a floating rate the monetary authority does not try to keep the exchange rate at any particular level and need not buy or sell foreign currency at all if it does not want to. Under a fixed exchange rate, institutional constraints exist that prevent sterilized intervention, so the monetary base is closely linked to the level of foreign reserves. Foreign reserves are always sufficient to ensure that anybody who wants to exchange the local monetary base for the anchor currency at the fixed exchange rate can do so.

## V. POLICY IMPLICATIONS

Our analysis of major recent currency crises suggests several implications for U.S. monetary policy and U.S. participation in international monetary affairs.

***Pegged exchange rates (those between the extremes of fixed and floating rates) are highly susceptible to currency crises.*** Relatively hard pegged exchange rates have been at the root of all recent major currency crises, as well as many other recent and older crises. Avoiding pegged exchange rates reduces the chance of suffering currency crises, though it does not necessarily eliminate crises entirely.

***Avoiding pegged exchange rates implies choosing either to have a floating exchange rate under central banking, or to forego a national central bank and have a fixed exchange rate under some other arrangement.*** To repeat, not all types of monetary authority are capable of maintaining all types of exchange rate. Central banks typically have considerable difficulty maintaining fixed or even pegged exchange rates. In most cases, choosing to have a national central bank is thus an implicit choice that the exchange rate will ultimately become a floating rate. Countries that want to have fixed exchange rates stand a far better chance of making the fixed rates durable if they instead dollarize, establish an orthodox currency board (a currency board-like system may not be durable enough), or join a multinational central bank (which involves fixed exchange rates among member countries, but not necessarily with respect to nonmembers).

***The U.S. government should avoid supporting pegged exchange rates in other countries.*** In a speech given in April 1999, Robert Rubin, then Secretary of the Treasury, said “the international community should not provide exceptional large scale official finance to countries intervening heavily to defend an exchange rate peg.”<sup>20</sup> Even so, later in the year the United States agreed to a crawling pegged exchange rate in Turkey supported with funds from the IMF, to which the United States is the largest contributor. The peg collapsed in a currency crisis in February 2001. The current Secretary of the Treasury, Paul O’Neill, has also indicated skepticism about pegged exchange rates. In

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<sup>20</sup> Rubin (1999).

testimony before the House of Representatives Committee on Appropriations, he remarked that “it is not so clear to me we want these international institutions to get into the business of speculation any more than we want countries to peg their currency and lose all their reserves because they are trying to defend the indefensible.”<sup>21</sup> It would be desirable for the Treasury to clarify what the implications are for U.S. policy in practice, since pegged exchange rates still have important international support despite the experience of recent major currency crises.<sup>22</sup>

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Senior Economist to the Chairman

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<sup>21</sup> Testimony in U.S. House of Representatives (2001).

<sup>22</sup> See French and Japanese Staff (2001) and Williamson (2000). These authors would object to classifying their proposals as types of pegged exchange rates. They call their proposals “managed floating” or “target zones,” and consider them sufficiently flexible to avoid the problems that have befallen hard pegs. However, the fundamental problems that affect hard pegs also affect these more flexible exchange rates eventually, because they are not fully flexible.

## APPENDIX. SUMMARIES OF RECENT MAJOR CURRENCY CRISES

**European Monetary System (EMS) (September 1992-August 1993).** As a result of monetary policy decisions related to German reunification (1989-90), Germany raised interest rates to high levels. A referendum of June 2, 1992 defeated the Danish government's proposal to sign the Maastricht treaty of economic and monetary union, creating doubts about the political viability of the union. Currencies in effect pegged to the German mark, whether within the EMS's Exchange Rate Mechanism or outside it as "shadowers," suffered speculative attacks. Finland (a shadower) floated on September 8. On September 13, Italy devalued 7 percent; on September 16, it and the United Kingdom floated, while Spain devalued 5 percent. Sweden (a shadower) floated on November 19. Spain and Portugal devalued 3 percent on November 22. Norway (a shadower) floated on December 10, and Ireland devalued 10 percent on January 30, 1993. Spain devalued 8 percent on May 13, while Portugal devalued 6.5 percent. On August 1, target zones were widened from  $\pm 2.25$  or  $\pm 6$  percent to  $\pm 15$  percent for countries still in the Exchange Rate Mechanism. The widening was so big as to be in practice a float that relieved pressure on Belgium/Luxembourg (which had a common currency), Denmark, and France, which had not devalued. The Netherlands remained within the narrow target zone and did not devalue.

For most countries, depreciations after floating were small. The crisis resulted in mild recessions in most countries in 1993 but created no problems for financial systems and had no involvement by the IMF. On January 1, 1999, most of the countries involved established truly fixed exchange rates by replacing their national currencies with a common currency, the euro, issued by the multinational European Central Bank.

**CFA franc zone (August 1993-January 1994).** The CFA franc zone comprises a number of former French African colonies. The zone has three central banks: that of the Comoros, the Banque des États de l'Afrique Centrale (for Cameroon, Central African Republic, Chad, Congo-Brazzaville, Equatorial Guinea, and Gabon), and the Banque Centrale des États de l'Afrique de l'Ouest (for Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, and Togo). The CFA franc had been officially pegged at 50 per French franc for almost half a century. However, the central banks of the CFA franc zone had made extensive loans to government-owned banks in the member countries. As a result, the foreign-currency reserves of the central banks fell below the statutory minimum of 20 percent, and they suspended the exchange rate effective August 2, 1993. Effective January 12, 1994, the two multinational central banks devalued to 100 CFA francs per French franc and the central bank of Comoros devalued to 75 local francs per French franc.

The IMF approved loans of up to 10 billion French francs (\$1.6 billion) to the members of the zone. The French government cancelled all development aid debt owed by the ten poorest countries in the zone and cancelled half the development aid debt owed by the remaining four countries, for a total of 25 billion French francs (\$4 billion). Most of the zone was in a recession before the devaluation and resumed growth afterwards. Banking systems in some countries were restructured.

**Mexico (tequila crisis) (December 1994-1995).** Mexico's central bank maintained the value of the peso within a band that depreciated 4 percent a year against the U.S. dollar. In an attempt to reduce interest rates on its debt, the Mexican government in April 1994 began issuing Cetes, short-term debt linked to the U.S. dollar. The amount of Cetes soon exceeded the central bank's falling foreign reserves. In early December, unrest in Chiapas province led to a speculative attack on the peso. On December 20, 1994 the government in effect devalued the peso by 15 percent by widening the band, but made no other policy changes. The crisis continued, and on

December 22 the government let the peso float. The peso depreciated from 3.46 per dollar before the crisis to more than 7 per dollar.

To end the crisis, Mexico received pledges for loans of as much as \$48.8 billion, including \$17.8 billion from the IMF and \$20 billion from the U.S. government's Exchange Stabilization Fund. Mexico's economy suffered a depression and banking problems that led to government bank rescues. In early 1995, speculative attacks spread to other Latin American countries and East Asia. Argentina went into a sharp recession, but its currency board-like system (officially fixed to the dollar) did not devalue. Argentina assembled a \$7 billion package of loans from private and government sources. The package included \$2 billion from the IMF in addition to previous approval of up to \$3.8 billion. Argentina closed or restructured banks owned by provincial governments.

**East Asia (July 1997-1998).** In early 1997, Thailand's central bank spent most of its foreign reserves trying to prop up an exchange rate pegged to a basket dominated by the U.S. dollar. When Thailand floated on July 2, 1997, other currencies linked to the dollar came under attack. The Philippines in effect floated on July 11, Malaysia on July 14, Indonesia on August 14 (after widening its band July 11), Taiwan on October 17, and South Korea on December 16 (after widening its band November 19). Vietnam widened its band on October 14, 1997 and devalued 5.3% on February 16, 1998. Singapore allowed its heavily managed float to depreciate starting July 17, 1997. The currencies of Thailand, the Philippines, Malaysia, Indonesia, and South Korea depreciated substantially before partly recovering. Hong Kong's currency board-like system suffered speculative attacks and large stock-market declines in August and October but did not devalue. China protected its officially pegged exchange rate by tightening exchange controls. Malaysia ended its float on September 1-2, 1998 by repegging and imposing exchange controls.

The IMF approved loans totaling up to \$115 billion for Indonesia, the Philippines, South Korea, and Thailand; all four made expensive bank rescues. In 1998, Hong Kong, Malaysia, the Philippines, Singapore, South Korea, and Thailand suffered recessions. Indonesia had a depression, the only case of high inflation among the crisis countries, and unrest that caused its authoritarian president to resign.

The currencies of China and (starting September 1998) Malaysia were officially pegged and the currency of Hong Kong was officially fixed to the U.S. dollar; the currencies of Thailand and Vietnam were officially pegged to baskets dominated by the U.S. dollar; and the currencies of the other countries were unofficially linked to the dollar with varying degrees of rigidity. Ripples from the crisis reached around the world.

**Russia (August 1998).** The Russian government was paying very high interest rates on its short-term debt. Falling prices for oil (a major export) and a weak economy also contributed to speculative attacks against the ruble, which had an official crawling band with the U.S. dollar. The IMF approved loans for Russia of up to \$11.2 billion on July 20, 1998, but on August 17 the government widened the band for the ruble by 35 percent, in effect devaluing. The crisis continued, and the government let the ruble float on September 2. The ruble depreciated from 6.2 per dollar before the crisis to more than 20 per dollar in September before recovering some. The government defaulted on its ruble-denominated debt and Soviet-era foreign debt, and imposed a moratorium on private-sector payments of foreign debt.

Russia went into brief recession and experienced a burst of inflation. Most banks became insolvent; the central bank rescued some. As a result of the Russian crisis, the U.S. hedge fund Long Term Capital Management came close to bankruptcy in September and was rescued in an effort coordinated by the Federal Reserve Bank of New York.

**Brazil (January 1999).** Brazil's central bank maintained an official crawling band between the *real* and the U.S. dollar. The band survived a Russia-related speculative attack from

August to October 1998, at the price of high interest rates. The IMF approved loans of up to \$18 billion on December 2, 1998. A state government defaulted on payments to the federal government, prompting a renewed speculative attack. The government devalued the *real* by 9 percent on January 13, 1999. The crisis continued, and the government let the *real* float on January 18. The *real* depreciated from 1.21 per dollar before the crisis to 2.18, then recovered some after the central bank briefly raised interest rates above 40 percent.

The economy, which had been in a recession, began to grow, and inflation remained in single digits. The financial system suffered little. Brazil's devaluation contributed to recessions in Argentina and Uruguay, for which Brazil is a large trading partner, and to speculative pressure on Ecuador, which floated its currency on February 12, 1999. (After continued currency turmoil, Ecuador became officially dollarized in 2000.)

**Turkey (February 2001).** The Turkish lira had an IMF-designed official crawling peg against the U.S. dollar. In late November 2000 rumors about a criminal investigation into ten government-run banks led to a speculative attack on the lira. Interbank interest rates rose to 2,000 percent. The central bank then intervened. Eight banks became insolvent and were taken over by the government. The central bank's intervention had violated Turkey's agreement with the IMF, yet the IMF lent Turkey up to \$10.4 billion on December 21. On February 21, 2001, a public spat between the president and prime minister caused investors to lose confidence in the stability of Turkey's coalition government. Interbank interest rates rose to 7,500 percent. The government let the lira float on February 22.

The lira depreciated from 668,000 per dollar before the crisis to 1.3 million, recovered some, then depreciated anew to about 1.6 million per dollar as of late October 2001. Turkey remains in a recession and inflation is expected to more than double, to about 60 percent in 2001. The IMF approved loans of up to \$8 billion more on May 18.

**Argentina (2001).** The Argentine peso, nearly fixed to the U.S. dollar in a currency board-like system, has suffered frequent speculative attacks since late 2000, related to fears the government will end the system and finance budget deficits by creating money. Government revenue has been falling because Argentina has been in a recession since 1998. On January 12, 2001, the IMF agreed to increase Argentina's authorization to borrow from \$6.7 billion to as much as \$14 billion. Speculative pressure on the peso intensified after Argentina announced a dual exchange rate system effective June 19. Pressure eased somewhat after the IMF agreed on September 7 to further increase Argentina's authorization to as much as \$21.6 billion. Argentina has not devalued, but as of late October 2001 the prime rate for loans in pesos remains about 12 percentage points above the rate for loans in dollars. (Dollar loans and deposits within Argentina actually exceed peso loans and deposits.) In late October, expectations arose that the Argentine government would restructure or default on its debt, with unclear implications for the monetary system.

On September 14 the IMF granted a stand-by credit of up to \$15.6 billion to Brazil to help it contain the spillover effects from Argentina's problems. The Brazilian *real* has depreciated from 1.95 per dollar at the end of 2000 to 2.70 per dollar as of late October 2001.

*Note:* Some loan packages involved additional funds from sources not listed here.

*Sources:* News reports through LexisNexis; IMF staff country reports.

## REFERENCES

- Aziz, Jahangir, Francesco Caramazza, and Ranil Salgado (2000) "Currency Crises: In Search of Common Elements," International Monetary Fund working paper 00/67, March, <<http://www.imf.org/external/pubs/ft/wp/2000/wp0067.pdf>>.
- BIS (1999) Bank for International Settlements, Monetary and Economic Department, *Central Bank Survey of Foreign Exchange and Derivatives Market Activity*, May, <[http://www.bis.org/publ/r\\_fx98finaltxt.pdf](http://www.bis.org/publ/r_fx98finaltxt.pdf)>.
- BIS (2001) Bank for International Settlements, Joint BIS-IMF-OECD-World Bank statistics on external debt, <<http://www.oecd.org/dac/debt/>>, update of May 31.
- Bordo, Michael, Barry Eichengreen, Daniela Klingebiel, and Maria Soledad Martinez-Peria (2001) "Is the Crisis Problem Growing More Severe?," *Economic Policy: A European Forum*, no. 32, April, pp. 53-82. Web appendix and data sets at <<http://www.economic-policy.org>>. An earlier version is available at <<http://emlab.berkeley.edu/users/eichengr/EconomicPolicy.pdf>>.
- Dornbusch, Rudiger (2001) "A Primer on Emerging Market Crises," forthcoming in Sebastian Edwards and Jeffrey Frankel, editors, *Preventing Currency Crises in Emerging Markets*, Chicago: University of Chicago Press. Also available as a National Bureau of Economic Research working paper, <<http://www.nber.org/books/ccprevent/primer2-3-01.pdf>>.
- Eichengreen, Barry, and Andrew Rose (2001) "Does It Pay to Defend Against a Speculative Attack?," forthcoming in Michael Dooley and Jeffrey Frankel, editors, *Managing Currency Crises in Emerging Markets*, Chicago: University of Chicago Press. Also available as a National Bureau of Economic Research working paper, <<http://www.nber.org/books/mgmtcrises/eichenrose4-20-01.pdf>>.
- Einzig, Paul (1970) *Foreign Exchange Crises: An Essay in Economic Pathology*, 2<sup>nd</sup> edition, New York: St. Martin's Press.
- Federal Reserve System (1999) Board of Governors, *Annual Report 1998*, Washington: Federal Reserve System. Also available at <<http://www.federalreserve.gov/boarddocs/rptcongress/annual99/ann99.pdf>>.
- French and Japanese Staff (2001) "Exchange Rate Regimes for Emerging Market Economies," jointly prepared discussion paper for Asia-Europe Finance Ministers' Meeting (ASEM), Kobe, Japan, January 13-14, <<http://www.mof.go.jp/english/asem/aseme03e.htm>>.
- Friedman, Milton (1988 [1984]) "Monetary Policy for the 1980s," in Kurt R. Leube, editor, *The Essence of Friedman*, Stanford, California: Hoover Institution Press, pp. 404-28.
- Glick, Reuven, and Michael M. Hutchison (2001) "Banking and Currency Crises: How Common Are Twins?," in Reuven Glick, Ramon Moreno, and Mark M. Spiegel (eds.), *Financial Crises in Emerging Markets*, Cambridge: Cambridge University Press, pp. 35-69.
- Gwartney, James, and Robert Lawson, with Charles D. Skipton and Walter Park (2001) *Economic Freedom of the World 2001 Annual Report*, Vancouver: Fraser Institute. Also available at <[http://www.fraserinstitute.ca/publications/books/efw\\_2001/](http://www.fraserinstitute.ca/publications/books/efw_2001/)>.
- Hanke, Steve H., and Kurt Schuler (1994) *Currency Boards for Developing Countries: A Handbook*, San Francisco: International Center for Economic Growth. A revised version is available at <<http://users.erols.com/kurrency/icegrev.htm>>.
- IMF (1999a) International Monetary Fund, *Brazil: Selected Issues and Statistical Appendix*, staff country report no. 99/97, September, <<http://www.imf.org/external/pubs/ft/scr/1999/cr9997.pdf>>.
- IMF (1999b) International Monetary Fund, *Russian Federation: Recent Economic Developments*, staff country report no. 99/100, September, <<http://www.imf.org/external/pubs/ft/scr/1999/cr99100.pdf>>.

- IMF (2001a) International Monetary Fund, *World Economic Outlook*, May, <<http://www.imf.org/external/pubs/ft/weo/2001/01/index.htm>>.
- IMF (2001b) International Monetary Fund, "IMF Approves Augmentation of Turkey's Stand-By Credit to US\$19 Billion," press release 01/23, May 15, <<http://www.imf.org/external/np/sec/pr/2001/pr0123.htm>>.
- IMF (various dates) International Monetary Fund, *International Financial Statistics*, monthly and annual volumes.
- Kaminsky, Graciela, Saul Lizondo, and Carmen M. Reinhart (1998) "Leading Indicators of Currency Crises," *IMF Staff Papers*, v. 45, no. 1, March, pp. 1-48, <<http://www.imf.org/external/Pubs/FT/staffp/1998/03-98/pdf/kaminsky.pdf>>.
- Kaufman, George G. (2000) "Banking and Currency Crises and Systemic Risk: A Taxonomy and Review," *Financial Markets, Institutions and Instruments*, v. 9, no. 2, pp. 69-131. An earlier version is available at <<http://www.sba.luc.edu/research/wpapers/991103.pdf>>.
- Krugman, Paul, editor (2000) *Currency Crises*, Chicago: University of Chicago Press.
- Leblang, David A. (2000) "To Devalue or Not to Devalue? The Political Economy of Exchange Rate Policy," unpublished paper, Department of Political Science, University of Colorado. A shorter, updated version is available at <<http://sobek.colorado.edu/~leblang/defend2001.pdf>>.
- Radelet, Steven, and Jeffrey Sachs (1998) "The East Asian Financial Crisis: Diagnosis, Remedies, Prospects," *Brookings Papers in Economic Activity*, no. 1, pp. 1-90.
- Rose, Andrew K. (2001) "Discussion" (comment on Bordo and others 2001), *Economic Policy: A European Forum*, no. 32, April, pp. 75-7.
- Roubini, Nouriel, Web site, <<http://www.stern.nyu.edu/globalmacro/>>.
- Rubin, Robert (1999) "Remarks on Reform of the International Financial Architecture," speech at the Johns Hopkins University School of Advanced International Studies, Washington, April 21, <<http://www.ustreas.gov/press/releases/pr3093.htm>>.
- Schuler, Kurt (2000) "Basics of Dollarization," staff report, Office of the Chairman, Joint Economic Committee, U.S. Congress, January, in *Achieving Growth and Prosperity Through Freedom: A Compilation of 1999-2000 Joint Economic Committee Reports*, Senate Print 106-58, 106<sup>th</sup> Congress, 2<sup>nd</sup> Session, Washington: Government Printing Office. Also available at <<http://users.erols.com/kurrency/basicsup.htm>>.
- Selgin, George A., and Lawrence H. White (1994) "How Would the Invisible Hand Handle Money?" *Journal of Economic Literature*, v. 32, no. 4, December, pp. 1718-49.
- Turkey (2001) "Letter of Intent and Memorandum on Economic Policies" for the International Monetary Fund, May 3, <<http://www.imf.org/external/np/loi/2001/tur/02/index.htm>>.
- U.S. House of Representatives (2001) Committee on Appropriations, Subcommittee on Foreign Operations, Export Financing, and Related Programs, hearing, May 21, transcript by Federal Document Clearing House through Nexis ("U.S. Representative Jim Kolbe (R-AZ) Holds Hearing on Treasury Department Budget").
- Williamson, John (2000) *Exchange Rate Regimes for Emerging Markets: Reviving the Intermediate Option*, Washington: Institute for International Economics.
- World Bank (1999) *World Development Indicators on CD-ROM*, Washington: World Bank.