

American countries except the largest. In 1995, the Equivalent Producer Subsidy represented 41% of the production value of these products. This high level persisted in spite of the fact that it had decreased from 20% to 15% in the United States from 1994 to 1995 as a result of lower direct payments and higher world market prices, whereas it had increased in the European Community mainly due to the incorporation of new members.³⁴ It should be noted that this 20% increase in total support occurred during the decade in which the Uruguay Round was negotiated and in which the official discourse focused on state reduction.

Contrarily, support of this kind has been systematically eliminated in Latin American countries because of the discourse on globalisation and the pressure of international organisations. Although comprehensive information regarding support to agriculture in these countries is lacking, the FAO, based on different studies, accepts that this particular tendency is confirmed in Latin America³⁵ as well as in grain producing countries.³⁶ As long as industrial countries maintain subsidies and developing countries reduce them the asymmetry between these economies will

not only remain, it will become larger. Nor will this asymmetry abate if Latin America keeps exporting coffee, oil seeds, tropical and subtropical fruit as well as fruit juice, meat and animal food or if it continues focusing on maquila production based on cheap labour and inputs that are specifically imported for exportable production.

Evidence leads to the inevitable conclusion that in trade liberalisation there is a gap between what industrial countries say must be done and what they do to make it happen. If the EU continues granting subsidies to agriculture and to other sectors and maintains its protectionist stance, it will be extremely difficult for negotiations to level out the playing field. Under these conditions, the gap between what Latin America sells to the EU and what it buys from the EU will continue to expand.

³⁴ FAO: Commodity Market Review, 1996-97, p. 7.

³⁵ A. Valdés: Surveillance of agricultural price and trade policy in selected Latin American countries at the time of major reform, The World Bank, 1996.

³⁶ FAO: Review of Cereal Prices Developments in Selected Developing Countries in 1995-96 and Policy Response, Commodity and Trade Division, September 1996.

CURRENCY CRISES

Gerhard Aschinger*

Why Do Currency Crises Arise and How Could They Be Avoided?

In the 1990s currency crises arose in different regions, e.g. in Mexico, East Asia, Russia, Brazil and Ecuador, to mention only the most important ones. What are the main factors which may trigger such events? How does globalisation and deregulation of financial markets influence the emergence of a currency crisis? What forms of crises exist? Are they driven by fundamental imbalances in a country or are they caused by self-fulfilling mechanisms involving herd behaviour and destabilising speculation? To what extent do such crises reflect implicit governmental and international guarantees which may cause moral hazard and adverse selection, thereby increasing the risk behaviour of enterprises and banks?

A currency crisis is characterised by a sudden attack on a country's currency, which will devalue accordingly. Although currency crises may also occur under flexible exchange rates, the pegging of the domestic currency to a reserve currency (e.g. the US

dollar) creates a higher potential for such crises since under flexible exchange rates investors directly bear the exchange-rate risk. The commitment of a government to defending the peg of its currency (falsely) signals investors that exchange-rate risks are virtually non-existent. It is often believed that domestic money could always be exchanged for

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foreign currency at par such that the central bank's foreign reserves would not be exhausted. A loss of confidence, however, may exert heavy pressure on the domestic currency, leading to a currency attack and thereby depleting the foreign currency reserves of the central bank even if the amount of these reserves seemed to be sufficiently high. Whatever the reason for the increased demand for foreign currency, a fixed peg would amplify the danger of a currency crisis.

Factors which may Trigger a Currency Crisis

Although different currency crises in emerging economies depend on specific constellations and evolutions, they are driven by important common factors as well. Some influential determinants which may trigger currency attacks are discussed below.

Introducing a Peg: Many developing countries suffering from economic imbalances such as high inflation or budget deficits decided to peg their currency to a reserve currency as a nominal anchor in order to stabilise the domestic economy. Under fixed exchange rates a country has an incentive to discipline its economic policy in order not to lose too much of its foreign currency reserves. While maintaining the peg, the home country may "inherit" stability from the reserve currency country and gain the confidence of investors. Especially in emerging economies which need a high amount of foreign credit to finance economic growth, a stable exchange rate is a prerequisite for attracting substantial capital inflow. Although exchange-rate risks seem to be eliminated by introducing a peg, the danger of a currency attack is reinforced in the longer run, given the fact that capital is highly volatile and susceptible to pessimistic expectations. In such situations investors have an incentive to exchange domestic currency for foreign currency at a given price.

Globalisation and Capital Flows: With the globalisation of financial markets international capital mobility has increased enormously. Financial deregulation, the elimination of capital controls, the liberalisation of local markets and the ample creation of derivatives has intensified competition in the financial industry and reduced transaction costs. Technological improvements in telecommunication and computer facilities have led to a widespread financial network. Together with the extension of trading foreign shares at different stock exchanges, this has constituted a world market, making possible financial transactions 24 hours a day around the globe.

Emerging economies (especially in East Asia) experienced high economic growth over a long period of time, encouraged by low salaries, skilled labour and attractive investment opportunities especially during the recession in industrial countries in the 1990s. In order to attract capital, emerging economies liberalised their financial sectors to facilitate access by foreign investors. Since equity and obligation markets in such countries are not sufficiently developed, capital inflows usually take the form of bank credits. The lack of efficient institutions and supervision of the banking system as well as the absence of binding rules for risk management and bookkeeping standards enhanced the danger of financial distress.

While foreign direct investment constituted an important part of capital imports, the share of short-run capital inflows (portfolio investment) increased substantially over time. With globalised financial markets, short-run capital became extremely volatile, reacting quickly to changes in investors' expectations. Using short-term capital to finance long-run investment augmented the default risk of firms and banks.

Excessive Credit Creation: Given the peg, strong capital inflows led to a substantial accumulation of central banks' foreign currency reserves and to an increase in money supply and domestic credit although emerging countries pursued stabilising monetary and fiscal policies in order not to run into inflation. Domestic firms and banks increasingly demanded credits in foreign currency, due to the fact that foreign interest rates were lower than domestic ones and the government was expected to guarantee the peg. Ignoring exchange-rate risks the interest differential seemed to be too high. The accumulation of short-term foreign debt could therefore trigger a currency crisis. The need to pay back maturing foreign debt and to make interest payments would induce domestic firms to buy foreign currency from the central bank at the given peg. If doubts should arise concerning the maintenance of the peg, foreign creditors would be reluctant to roll over their loans to domestic firms, and if they ever did then only at higher cost. Debtors would fear that their foreign exposure would sharply increase in domestic currency terms in the case of a devaluation.

Moral Hazard: Abundant liquidity is an incentive for banks to give easy credits. Implicit government guarantees (including the lender of last resort function of the central bank) give rise to moral hazard and

adverse selection. While granting credits, banks would earn large profits in the case of positive events whereas for negative ones they could burden heavy losses on society. In East Asian countries e.g. domestic banks and firms increased their risk exposure to a large extent, which led to a growing number of inefficient investments. Widespread corruption and nepotism reinforced this tendency. Overinvestment led to "suffering" credits but banks did not write them down.

Another source of moral hazard was the expected financial help the IMF (together with other organisations and governments) would offer to countries experiencing a currency crisis. The expected bail out induced private foreign creditors to accept the growing accumulation of debts by domestic firms and banks. In order to reduce moral hazard, implicit guarantees would have to be reduced while private creditors should be induced to bail in and bear their own risks. Implicit government guarantees, however, should not be totally eliminated in order to avoid a disruption of the financial system that would give rise to extreme costs.

Real Estate Bubbles and Bank Runs: In many East Asian countries domestic credit expansion generated a boom in the real estate sector and equity markets, which gave rise to speculative bubbles. The inflation of real estate prices was nourished by buoyous demand but prices began to fall when the saturation of the market and pessimistic expectations increased the number of non-performing loans. As bad loans were not paid back and many depositors withdrew their money, banks had to be closed. Bank runs finally put doubt on the government's ability to defend the peg. Faced with this situation, the government pursued a restrictive monetary policy which caused interest rates to climb in an unprecedented way. Even with rocketing interest rates it was not possible to stop the outflow of capital because devaluation risks were considered to be too high. The rise in interest rates forced many firms into insolvency.

Contagion of Currency Crises: Besides preceding real estate and banking crises there are many other factors which may contribute to a currency crisis: investors' pessimism about a country's creditworthiness, high volatility of short-run capital, liberalisation of local markets without flanking regulative measures and a new institutional framework, a current recession, political unrest, corruption and nepotism. A peg which favours the influx of capital at an earlier

stage will create an incentive for short-run capital to flow out in the case of declining confidence.

Contagion is another important reason for a currency crisis. Difficulties or crises in certain countries may place doubt on the economic stability of other countries and areas. The more a country is linked with one that is suffering from a currency crisis, either through a similar export structure, or intensive mutual trade, the same culture and language, exposure to the same type of external shocks, a similar financial market structure etc. the more susceptible it is to such a crisis. There can be an awakening effect: countries which seem to be similar to a country that actually experiences a currency crisis are suspected of being prone to run into the same difficulties. Such generalisations without a thorough inspection of a country's specific situation may trigger a crisis in a country which in fact has sound fundamentals. There is a tendency towards herd behaviour.

If some countries devalued their currency to a large extent, other countries in the region were forced to devalue as well in order not to lose competitiveness. Cumulative devaluations (experienced during the East Asian crisis) augmented the danger of serious harm to international trade as in the 1930s.

IMF Programmes: Rescue programmes for countries experiencing a currency crisis were offered by the IMF, and other organisations and countries ex post but not ex ante. It is not evident, however, that preventive programmes avoid currency crises, no matter the amount of financial support, since the driving forces of such crises are often too powerful to be stopped. IMF credits were granted on the condition that stringent stability requirements were met, involving restrictive monetary and fiscal policy, which led to sharp increases in interest rates and recession. In certain cases, e.g. in East Asia, the IMF even bound countries to attain budget surpluses. Such policy measures raised unemployment and aggravated the crisis. The IMF also urged countries to further liberalise their financial markets immediately following the outbreak of a currency crisis, thereby provoking the additional outflow of capital rather than stabilising the situation. As a consequence social unrest and protests unfolded in countries such as Indonesia and South Korea. In 1998 the IMF acknowledged faults in its policy and tried to correct them by slackening the rules. Investors' confidence with respect to countries experiencing a currency crisis were not restored by the "medicine" ordered by the

attack is advanced to the earliest possible time where the exchange rate devalues continuously. These models use the same elements as those of exhaustible resources, where an attack on the resources takes place whenever the shadow price moves over the fixed price. In models of currency crises foreign exchange reserves are treated as exhaustible resources. It is shown that internal imbalances are not consistent with a fixed peg.

Besides unfavourable fundamentals, self-fulfilling expectations can trigger a currency crisis as well. Second generation models of currency crises show that if the fundamentals lie within a specific interval a currency attack may occur or not, depending on the exchange-rate expectations of investors. In such models the optimal mix of government policies is determined by minimising a loss-function which measures different policy goals including the choice of the exchange-rate system. In contrast to first generation models there may be a deliberate government decision to abandon a fixed peg if other goals seem to be more important.

It is sometimes argued that self-fulfilling processes reflect fundamentals and are therefore a rational explanation for a currency crisis. Herd behaviour e.g. can be rational if non-informed investors adopt the views of smart investors when information can be obtained only at high costs. However, a self-fulfilling process may be influenced by mass psychology involving irrational behaviour. Kindleberger showed in his pioneering book "Manias, panics and crashes" that in speculative crises irrational behaviour occurs which leads to euphoria and panic.²

According to Kindleberger, speculative crises can be characterised by different stages:

- (1) *displacement*: an exogenous shock operates on a macroeconomic system,
- (2) *development of a boom*: if positive changes predominate,
- (3) *expansion of bank credits*: increasing liquidity augments credit supply,
- (4) *rising speculation*: at first stabilising speculation prevails and rational behaviour dominates,
- (5) *euphoria*: irrational behaviour leads to destabilising speculation and exaggerations,

(6) *abrupt changes in expectations*: instability has increased to the extent that continuous adjustment is no longer possible,

(7) *panic*: mass selling of the speculative good leads to a crash.

The market efficiency hypothesis, which states that all public information is instantaneously reflected in prices, is not fulfilled for all financial market events. Many anomalies exist for financial markets that seem to be driven by investors' sentiments and may also include irrational behaviour. In behavioural finance such mechanisms are studied. Shiller in his book "Irrational Exuberance" pointed out that most investors base their financial decisions on personal feelings and random observations rather than on quantitative analyses.³

Concerning currency crises one can distinguish between informational and speculative crises. An informational crisis explains a currency attack by the appearance of relevant negative news which has an impact on the valuation of the exchange rate. The deterioration of a country's fundamentals may e.g. lead to an informational currency crisis. The question is, whether information is reliable and relevant for the intrinsic value of a currency and will therefore reflect the rational behaviour of investors. With imperfect and asymmetric information, expectation formation may trigger a self-fulfilling crisis which, under certain circumstances, reflects rational behaviour.

Speculative currency crises involve irrational motives which may lead to exaggerations. New relevant information does not arrive shortly before a currency attack. At the time just before a speculative crisis occurs, no change in fundamentals takes place. Such a crisis develops over time while the instability of the system grows. The delay rule applies, which means that local continuous adjustments are pursued up to the last moment when an abrupt move of the exchange rate takes place and corrects the inherent imbalance.

Recent Currency Crises

There have been several important currency crises in recent years:⁴

³ R.J. Shiller: *Irrational Exuberance*, Princeton University Press, Princeton, New Jersey 2000.

⁴ These currency crises are described and analyzed at length in G. Aschinger, op. cit.

² C.P. Kindleberger: *Manias, Panics and Crashes – A History of Financial Crises*, Basic Books, New York 1978.

□ *The Mexico crisis (1995)*: The difficulties arising from the debt crisis of 1982 were consolidated in Mexico by stabilisation programmes which involved restrictive monetary and fiscal measures, a solidarity pact between employers, employees and the government, and widespread liberalisation. Due to a restriction on government expenditure a balanced budget was reached in 1990, while average real GDP growth amounted to 3% p.a. and the inflation rate was reduced to 7% p.a. by 1994. Positive economic prospects which were accentuated by Mexico's membership of NAFTA and the OECD led to a massive inflow of short-term foreign capital. Mexico used a crawling peg vis-à-vis the US dollar. As devaluation steps proved to be insufficient to eliminate the interest differential, the peso revalued in real terms. This led to reduced competitiveness and growing current account deficits. Rising US interest rates at the beginning of 1994 drained portfolio capital out of Mexico and the government had to issue dollar-indexed obligations (*tesobonos*) in order to roll over its foreign debt. Together with political instability and easy monetary and fiscal policies before the presidential election this led to speculative attacks against the peso, which devaluated about 30% up to early January 1995. Financial markets, however, did not anticipate the currency crisis.

□ *The East Asia crisis (1997)*: East Asian countries experienced high real GDP growth rates for many years and achieved substantial budget surpluses while inflation rates remained low. These countries used a fixed peg with respect to the US dollar. Strong capital inflows, especially of portfolio capital, brought about a high accumulation of credits and a boom in the real estate and equity markets. Moral hazard driven by implicit guarantees, poor risk management and a lack of supervision of the banking system produced a high number of failing credits which led to real estate and bank crises. Corruption and nepotism together with a high degree of monopolisation in industry accentuated the vulnerability of East Asian countries. In spring 1997 the currency crisis started in Thailand and with the devaluation of the baht it quickly expanded to the Philippines, Malaysia, Indonesia and finally to South Korea. Contagion was an important factor since all East Asian countries faced similar problems. Since the outbreak of the crisis up to March 1998 the currencies of these countries devalued about 50% with the exception of the Indonesian rupiah which lost about 80% of its value against the US dollar. Also in this case, financial markets did not foresee the crisis.⁵

□ *The Russia crisis (1998)*: With the transition to a market economy in 1990 Russia experienced serious difficulties since many industries and their products turned out to be obsolete. The deep economic crisis was marked by high inflation rates, a reduction of real GDP, an increasing budget deficit and declining current account surpluses. Frequent changes of government added to incertitude. In 1995 the rouble was pegged to the US dollar using an exchange-rate band. The support of western governments and new investment opportunities led to a strong influx of portfolio capital since investors bought large amounts of government bills (GKO's). The fragility of the Russian economy led to a massive outflow of capital at the beginning of August 1998. To restructure Russian debt a 90-day moratorium was announced, which put strong pressure on the rouble. On August 28 flexible exchange rates were introduced and the rouble devalued more than 50% within a few days.

□ *The Brazil crisis (1999)*: The Brazilian economy showed a high and persistent inflation over many years, which reached a four-digit level in 1994. With the help of a stabilisation plan (*Plano Real*) which included a monetary reform and fiscal measures, inflation was quickly reduced and the government budget became balanced. The new Brazilian currency, the real, was linked to the US dollar by a crawling peg. Since the stepwise devaluation of the Brazilian currency was insufficient it revalued in real terms. As a consequence a high current account deficit was generated and a large budget deficit evolved because of the lack of fiscal discipline. Brazil was thus characterised by "twin deficits". In spite of pursuing a restrictive monetary policy which led to high interest rate increases, heavy losses of foreign exchange reserves resulted. In January 1999 a transition to flexible exchange rates took place and the Brazilian currency devalued by more than 40% within two weeks.

□ *The Ecuador crisis (2000)*: Ecuador experienced high inflation and low economic growth for many years. From 1996 on, there was a substantial deterioration of the fundamentals, so the current account and budget deficits climbed to high levels. Because of the growing pressure on the Ecuadorian currency the devaluation rate of the crawling peg of the sucre

⁵ A characterisation of the East Asia crisis is given e.g. in: G. Aschinger: *An Economic Analysis of the East Asia Crisis*, in: *INTERECONOMICS*, Vol. 33, 1998, No. 2, pp. 55-63.

against the US dollar was continuously raised. From 1997 to 1999 foreign exchange reserves were halved and in February 1999 the central bank decided to introduce flexible exchange rates. The sucre devalued more than 40% against the US dollar within two weeks. Because of considerable withdrawals of deposits, commercial banks were closed for one week in order to prevent a bank crisis. Ecuador became insolvent in September 1999 because the interest on Brady bonds could not be paid. Because of the impossibility of stabilising the sucre, the government decided to substitute its national currency for the US dollar. Dollarisation was thus introduced in September 2000.

Whereas the currency crises in Russia, Ecuador and Brazil were mainly driven by fundamental imbalances, the Mexico crisis was a self-fulfilling crisis and the East Asia crisis could be characterised as a speculative crisis which was influenced by moral hazard, triggering first a real estate and a bank crisis, which then led to a currency crisis.

Table 1 summarises some important aspects of currency crises in emerging countries. Currency crises involve similar phases, which were described above and are illustrated by Figure 1 for the East Asian crisis.

Measures That Could Prevent Currency Crises

With growing globalisation in financial markets, international capital became fully mobile and short-run capital very volatile. The potential for speculation increased enormously. While market imbalances would be cured by (stabilising) speculation if new relevant information appeared, destabilising speculation could lead economies into serious problems by means of self-fulfilling mechanisms. Open economies under globalised conditions are submitted to quick market changes that lack frictions. Such an economic system may become unstable analogously to dynamic mechanical systems, as illustrated by the following example. In the 19th century wheel bearings were improved substantially by reducing friction. In

Table 1
Comparison of Recent Currency Crises

	Mexico (1995)	East Asia (1997/98)	Russia (1998)	Brazil (1999)	Ecuador (2000)
Starting position	- low inflation - equilibrated budget - member of NAFTA and OECD - high current account deficit	- low inflation - high economic growth - budget surplus - high current account deficit	- low inflation - transition to market economy - high budget deficit - reduction of real GDP	- low inflation - high current account and budget deficits	- equilibrated budget - high inflation - high current account deficit - low economic growth
Currency peg	crawling peg vis-à-vis the US dollar	fixed peg vis-à-vis the US dollar	currency band vis-à-vis the US dollar	crawling peg vis-à-vis the US dollar (devaluation 7.5% per year)	crawling peg vis-à-vis the US dollar with increasing devaluation rate → transition to "dollarisation"
Deregulation/globalisation	liberalisation of local markets, reduction of capital controls, privatisation				
Capital inflows	high inflow of short run capital (portfolio investment), increase of money supply				
Domestic credit expansion	high liquidity of banks, moral hazard, adverse selection, accumulation of non-performing credits; increase in speculation → boom in real estate and equity markets				
Increase of credits in foreign money	increase of debts in foreign currency of domestic firms and banks (without hedging in East Asian countries), increasing foreign debts of government, expectation of obtaining IMF credits				
Factors that trigger the currency crisis	domestic political problems	bank and real estate crises, moral hazard	threatening insolvency of government sector, moratorium of private foreign debts	moratorium of local states, problems with curing governmental debts	reduction of oil price, bank crisis, domestic political problems
Models to explain crisis	second generation models: self-fulfilling currency crisis	models of bank and real estate crises, model of speculative crisis (Kindleberger)	first generation models: fundamental crisis	first generation models: fundamental crisis	first generation models: fundamental crisis

the course of this technical progress steam engines showed unstable behaviour by the centrifugal force governor, which hampered smooth power transmission to the wheels. The only way to correct this was to reintroduce friction to the wheel bearings. This finding generally applies to dynamical systems and shows that a minimum of friction is necessary to guarantee stability.

In order to reinsert friction into a globalised economic system, one could think of levying a capital import tax, such as was applied in Chile for many years, of making use of capital controls or introducing a transaction tax on foreign exchange (Tobin tax), thereby throwing sand into the wheels of the super-efficient financial markets, as Tobin expressed it.⁶ A capital import tax has the advantage that the inflow of capital could be impeded in good times, whereas with a capital export tax or capital controls it would be difficult to prevent capital outflow during bad times. The Tobin tax collects a low but fixed percentage on the amounts of all foreign exchange transactions which should apply with the same rate to all kinds of transactions and in all countries. It does not seem possible to levy such a tax in the foreseeable future, given the fact that reaching an international agreement on this matter would be difficult. Capital controls, which were reintroduced in Malaysia and Russia, could be helpful to protect a country from huge capital outflows in the case of a currency crisis but they should be removed as soon as possible in order not to produce adverse effects on the country's competitiveness.

Local markets should not be liberalised too quickly without flanking measures such as a good supervising system for banks, requirements for capital ratios, risk management and bookkeeping devices. New financial institutions would have to be introduced or existing ones would have to be reformed.

Domestic firms and banks should not be allowed to borrow foreign money without authorisation from the government. High foreign indebtedness of domestic enterprises has been a main factor for the depletion of central banks' exchange reserves in the course of currency crises.

Implicit guarantees that give rise to moral hazard should be reduced but not eliminated. Private (domestic and foreign) creditors should not rely on being bailed out either by the government or indirectly

by international rescue programmes, but have to carry the risks themselves (bail in) in the case of a crisis. Foreign banks should then be required to extend their credits (roll over) to domestic debtors.

The peg of the domestic currency should not be defended under all circumstances. Some flexibility of the exchange rate would be desirable at an earlier stage in order to avoid a currency crisis. This also depends on the expectations of investors who might become suspicious and exchange domestic for foreign currency. If no peg were to exist, currency crises would be moderate, but the positive effects of a peg such as stabilising the economy in the case of high inflation or promoting economic growth could not be attained.

There are, however, different forms of pegs: crawling pegs, fixed pegs, currency boards or dollarisation. The crawling pegs used in Latin America (e.g. Brazil and Mexico) allowed mini-devaluations for countries under inflationary pressures, thereby reducing the likelihood of currency attacks. For a currency board the monetary basis must always be covered one hundred per cent by the foreign exchange reserves of the central bank. A currency board (e.g. Hong Kong and Argentina) seem to be more crisis-prone than a regular fixed peg because of the higher degree of monetary discipline demanded. Currency attacks, however, cannot be excluded for currency boards since the money supply (e.g. M1 or M2) is not covered one-to-one by foreign exchange reserves. With dollarisation a country has given up monetary policy, which is determined by the reserve country alone. For a country adopting dollarisation, however, there could be a problem in getting enough of the reserve currency in order to be prosperous and develop accordingly.

Corruption and nepotism should be fought and the monopolisation of industries with respect to *chaebols* in South Korea or big conglomerate firms in Indonesia should be put to an end. Credits should not be granted because of personal relations but rather be based on efficiency grounds.

Crisis contagion could be reduced if better information about the differences and similarities between countries were made available. Better transparency about the links and decision-making of industries and government could enhance investors' confidence in a particular country.

Given the condition of human nature, however, and in spite of the preventive measures taken, crises cannot be completely avoided at all times.

⁶ J. Tobin: A Proposal for International Monetary Reform, in: Eastern Economic Journal, 1978, p. 153-159.