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CURRENCY CRISES, SPECULATIVE ATTACKS AND FINANCIAL INSTABILITY IN A GLOBAL WORLD: A POST KEYNESIAN APPROACH WITH REFERENCE TO BRAZILIAN CURRENCY CRISIS

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Abstract:

This paper develops a critical view of the conventional currency crisis models and presents a Post Keynesian view on financial instability and speculative attack. It also analyzes the 1998/1999 Brazilian currency crisis, according to the Post Keynesian approach.

Key words: Currency crisis models; Keynesian and Post Keynesian theories; Brazilian currency crisis.

INTRODUCTION

In a recent article, Krugman (1997) reviews currency crisis models, dividing them in two types: "canonical" crisis models and second-generation crisis models. While the former explains different experiences of speculative attacks, the latter seems appropriate for understanding the European monetary crisis in 1992/1993. Subsequently, recognizing the failure of conventional theory in providing consistent answers for the East Asian crisis, Krugman (1998) develops a

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new approach on currency crisis in order to explain this specific crisis, based on the moral hazard/asset bubble view.

As stated by Krugman (Ibid. 6), conventional theory presumes that foreign exchange markets are efficient, that is to say they make the best use of available information, while, in the real world, foreign exchange market exhibits strong "anomalies". Efficient market theory claims that economic agents analyze past and present market data, which means that price signals are presumed to provide enough information about forming rational expectations as a basis for making utility maximizing decisions. All relevant information about "economic fundamentals" regarding the future currently exists and is available to the agents that are market participants and this information is embodied in the current market price signals. However, the author recognizes that foreign exchange markets can be inefficient[1].

Thus, currency crises can be generated either by self-fulfilling rational expectations or by irrational herding behavior involving bandwagon effects. But, even in models with self-fulfilling features it is only when fundamentals are sufficiently weak that a country is potentially vulnerable to speculative attack. In other words, currency crises are explained, even in last resort, by the inconsistency of economic fundamentals.

As is well known, efficient market theory has its foundation in the ergodic axiom, which means that the expected value of an objective probability can be always estimated from observed data that provides reliable information about the conditional probability function that will govern future outcomes. In this system, the decision maker believes that an immutable real objective probability distribution governs both current and future market outcomes. Therefore, market fundamentals are immutable in the sense that they cannot be changed by human actions; they also determine the conditional probabilities of future outcomes. According to the efficient market theory, short-run speculation can interfere with the efficient capital allocation function of financial markets and speculative volatility is explained by the existence of foolish "noise traders". Otherwise, the observed secular trend of financial markets is determined by immutable real sector fundamentals, which means that in the long-run irrational traders are made extinct by an efficient market (Davidson, 1998).

By contrast, Keynes and Post Keynesians reject the ergodic axiom of efficient market theory to explain the financial market behavior. In an uncertain world, in which fundamentals do not provide a reliable guide to the future, which

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[1] See, also, Stiglitz (1989) and Shleifer & Summers (1990) for a New Keynesian approach.

is subject to sudden and violent changes, future market valuations are always subject to disappointments. Thus, speculation is not an "anomaly", explained by the existence of foolish "noise traders"; on the contrary, it is a consequence of the operational way in which financial markets work in the real world. For Keynes and Post Keynesians, the outcome of speculation is ambiguous, because it can be disruptive with real consequences, devastating particular sectors as well as whole economies, once it can create speculative whirlpools; but at the same time it provides liquidity assets, an essential role of the financial markets.

This paper aims at analyzing the currency crisis models from a Post Keynesian perspective[2] and explaining the 1998/1999 Brazilian currency crisis, according to the Post Keynesian theoretical framework. Besides this introduction, the paper is structured as follows: Section 2 describes the main currency crisis models as well as develops a critical view of the conventional theory. Section 3 presents a Post Keynesian view of financial markets and speculative activity and also develops a Post Keynesian perspective on financial globalization and speculative attack. Section 4 realizes an analysis on 1998/1999 Brazilian currency crisis. Finally, some concluding comments are presented in Section 5.

CURRENCY CRISES MODELS: THE CONVENTIONAL THEORY

2.1. Speculative attack and currency crisis: the conventional theory[3]

Currency crisis can be defined as "a sort of circular logic – in which investors flee a currency because they expect it to be devalued, and much (though usually not all) of the pressure on the currency comes precisely because of this investor lack of confidence" (Krugman, 1997:1). On the other hand, a speculative attack on government's reserves "can be viewed as a process by which investors change the composition of their portfolios, reducing the proportion of domestic currency and raising the proportion of foreign currency. This change in composition is then justified by a change in relative yields, for when the government is no longer able to defend the exchange rate [that is, a currency depreciation begins]" (Krugman, 1995: 2).

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[2] While we intend to contrast the differences between mainstream theory and Post Keynesian approach, Andrade & Silva (1998) explore the convergence between these different views on currency crises.

[3] This section is based mainly on Krugman's ideas.

Currency crisis and speculative attack are used almost as synonymous, but in reality a speculative attack on government's reserves may or may not result in a currency crisis. It depends on the ability or the will of the government to defend the domestic currency. In this context, a currency crisis happens when the government cannot (perhaps, it does not want) to support the exchange rate.

According to Krugman (1997), in general, conventional currency crisis theory can be divided in two types of models: "canonical" crisis models and "second-generation" crisis models[4]. In a more recent work, Krugman (1998) added another view on currency crises for the understanding of the East Asian crisis – *i.e.*, the "third-generation" model -, which can be more properly referred as financial crisis models.

The "canonical" crises are the first generation crisis models (Krugman, 1979, and Flood & Garber, 1984) and they are derived from the models applied to commodity boards trying to stabilize commodity prices, known as "hotelling model". The logic of the currency crisis in "canonical" models is the following: at the point in which speculators are supposed to wait until the reserves exhausted in the natural course of events, they would know that the price of foreign exchange rate, fixed up to now, will begin rising. In this situation, people would hold foreign currency instead of holding domestic currency, leading to a jump in the exchange rate, and by doing so advance the date of the exhaustion of reserves When reserves fall to some critical level there would be an abrupt speculative attack that would quickly drive those reserves near to zero and, as a result, force an abandonment of the fixed exchange rate.

But what explains such crisis? According to this model, such crisis results of a fundamental inconsistency between domestic policies – typically the existence of money-financial budget deficits - and the attempt to maintain a fixed exchange rate, once the government is assumed to use a limited stock of reserves to peg its exchange rate. As this policy reveals to be unsustainable, the attempt of investors to anticipate the inevitable collapse would generate a speculative attack on the currency when reserves had fallen to some critical level. The main criti-

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[4] Besides these ones, it is important to say that there is what is known as *contagious* crisis; that is, a phenomenon in which a currency crisis in one country seems to trigger crisis in other countries. A *contagious* crisis can involve real linkages between countries (a currency crisis in country A can worsen the fundamentals of country B, or vice-versa) or not (as in the case of Mexico/Argentina, for instance), but the countries are perceived as a group with some common, even imperfectly, observed characteristics.

cism on this model is that it represents government policy in a mechanical way, once the role of central bank in the model is passive[5].

The "second-generation" crisis models (Obstfeld, 1994) are more sophisticated than "canonical" crisis models and the government policy in these models is less mechanical. In these models, government chooses to defend or not a pegged exchange rate by making a trade-off between short-run macroeconomic flexibility and long-term credibility.

The government must have a reason why it would like to abandon its fixed exchange rate or to defend it. Besides, the cost of defending a fixed exchange rate must itself increase when people expect that the exchange rate might be abandoned. In general, the main reason to allow currency depreciation in a country can be related to an increasing in unemployment due to downward rigid nominal wage rate, while a specific motive to fix the exchange rate can be related to the possibility of facilitating international trade and investment. According to these models, a fixed exchange rate will be costly to defend due to the fact that people, in the past, expected it would be depreciated at any time and/or because economic agents now expect it will be depreciated in the future. Thus, the logic of a crisis arises from the fact that defending a parity is more expensive (*i.e.*, it requires higher interest rates) if the market believes that defense will ultimately fail.

If a country's trade-off between the cost of maintaining the current parity and the costs of abandoning the fixed exchange rate is predictable, at some future date the country would be likely to devaluate its currency even in the absence of a speculative attack. In this case the speculators would try to get out of the currency ahead of that devaluation, but in doing so they would worsen the government's trade-off, probably leading to an earlier devaluation. The end of the story can be a crisis that ends the fixed exchange rate regime before the fundamentals appear to make devaluation necessary.

Summing up, currency crisis may result from a conflict between domestic objectives and the currency peg, which can make an eventual collapse of the currency peg inevitable. According to this approach, a speculative attack on a currency can also develop as a consequence of a predictable future deterioration in economic fundamentals, or purely through self-fulfilling prophecy, caused by a self-confirming pessimism, a case in which a country would suffer an "unnecessary" crisis. But even in the second-generation crisis, a currency crisis is essen-

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[5] For example, central bank does not make use of a variety of tools other than exchange market intervention to defend the exchange rate, as its ability to tighten domestic monetary policies.

tially the result of inconsistent policies with the long-run maintenance of a fixed exchange rate. In other words, it is only when fundamentals – such as foreign exchange reserves, the government fiscal position and the political commitment of the government to exchange regime – are sufficiently weak that the country is potentially vulnerable to speculative attack.

If a predictable crisis can happen before the fundamentals have reached the point where the exchange rate would have collapsed, then it can be provoked by a speculative attack not justified by current fundamentals. But, what prevents them? According to Krugman (1997), microeconomic frictions – such as transaction costs, the difficulty of arranging credit lines, and so on – may prevent a subjectively low probability crisis from ballooning into a full-fledged speculative attack.

Krugman (1998:1-2) now recognizes that "in order to make sense of what happened to [the 1997 East Asian crisis], it is necessary to adopt an approach quite different from that of traditional currency crisis theory", as in the East Asia the "currency crises were only part of a broader financial crisis, which had very little to do with currencies or even monetary issues per se". Thus, he develops a new approach on currency crisis – that is, "third-generation" crises models[6] – in order to explain this crisis based on the moral hazard/asset bubble view.

According to the "third-generation" crisis models, currency crisis is viewed as an integrated part of a general crisis of the economy, in which currency crises are pre-announced by financial crises. The logic of the analysis is that capital inflows increase the lending capacity of the banking system. So, the certainty of "bailout" of the financial institutions by the monetary authorities explains "bad lending" practices used by the banks. Finally, a growing financial fragility path is followed leading the way to speculative crises, once the increase in the money supply validates the bank run and, as a result, the economy begins to lose reserves.

In the case of the Asian crisis none of the fundamentals that drive "first generation" crisis models seem to have been observed in any of the afflicted Asian economies, and there did not seem to have any incentive to abandon the fixed exchange rate to pursue a more expansive monetary policy (as in the case of the 1992/1993 European monetary crisis). In other words, "Asian crisis is best seen not as a problem brought on by fiscal deficits, as in 'first-generation' models, nor as one brought on by macroeconomic temptation, as in 'second-generation' models, but as one brought on by financial excess and then financial collapse (...) The Asian story is really about a bubble in and subsequent collapse of asset

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[6] The "third-generation" approach was also developed in Calvo & Mendoza's (1996) analysis of the Mexican peso crisis.

values in general with the currency crisis more a symptom than a cause of this underlying (in both senses of the word) malady" (Ibid.:3).

In the East Asia, a boom-bust cycle created by financial excess preceded the currency crisis because the financial crisis was the real driver of the whole process. According to the moral hazard/asset bubble view, "the problem with financial intermediaries – institutions whose liabilities were perceived as having an implicit government guarantee, but were essentially unregulated and therefore subject to serve moral hazard problems [and] the excessive risky lending of these institutions created inflation – not of goods but of asset prices" (Ibid.:3), resulting in overpricing of assets. However, the bubble of prices caused a deflation of assets and a deterioration in banking credits. Once a bank crisis has just been burst, the running against domestic currency was the natural consequence of the financial panic.

2.2. Some critiques on conventional view of speculative activity and currency crises

As stated before, according to the efficient market theory, agents with rational expectations make the best use of the available information, so that stock prices always reflect fundamental values. The social function of financial markets is to correctly allocate capital among enterprises in accordance with reliable information about future rates of returns determined by fundamentals.

In this sense, how can someone explain the speculative activity into this theory? Speculation is the activity of buying (selling) and reselling (rebuying) assets in order to anticipate market value and making money by exploring "delays" in adjusting market prices to new economic fundamentals. Therefore, mainstream cannot explain why there is speculation without *ad hoc* assumptions. Speculators can only survive if there are (i) informational problems, and (ii) waves of irrationality, which are attributes of "delay" markets. The problem in adopting *ad hoc* assumptions is that they provide excessive freedom to the formulation of the models, generating, in this case, a contradiction inside the general equilibrium model framework.

Stiglitz (1989), for example, points out that short-term traders only include "noise traders" – investors who believe that know more than the market and therefore do not have to acquire the correct information regarding future outcomes from the fundamentals. Of course, these phenomena can only occur in the short-run due to the fact that rational people conduct market towards long-run trend. Therefore, in spite of speculation, the economy will go towards the long-run equilibrium. Otherwise, is spite of short-term effects, speculation "affects how the pie is divided, but does not affect the size of the pie" (Ibid.:103). As it ap-

pears, the mainstream categorically supports that there is a kind of *speculation neutrality axiom*, since, at least in the long-run, the size of the pie is determined by fundamentals. In other words, *there are no long-run real effects if we assume (ad hoc) short-term speculation.*

As conventional theory presumes that foreign exchange markets are efficient, according to the currency crisis models, speculative attack only occurs if there exists any sort of real "market fundamentals", in general associated to a current or predictable future deterioration in economic fundamentals: an inconsistency or a conflict between domestic policies and exchange rate policy. These models also describe currency crises that are not driven by fundamentals, generated by self-fulfilling rational expectations or by irrational herding behavior – the case in which a wave of selling, whatever its initial case, could be magnified through sheer imitation or turn. The point is that they have difficulty in finding consistent explanations for currency crises that are not driven by fundamentals.

In an ergodic world, in which market fundamentals determine the conditional probabilities of future outcomes, speculative activity in foreign exchange markets is explained by the actions of foolish "noise traders". Krugman (1997), for instance, utilizes microeconomic fundamentals that make market inefficiencies to explain the existence of "herding" or the possibility of self-fulfilling crisis – as investors with access to private information, creating asymmetric information in exchange rate market, or investment funds being managed by professional agents rather than directly by principals, that can result in investing money in crisis-prone countries.

Besides utilizing *ad hoc* microeconomic fundamentals for the explanation of "irrational" crisis, conventional theory is always trying to find an *ex post* explanation for each "new" currency crisis, as in the cases of European monetary crisis in 1992/1993, Mexican peso crisis in 1994/1995, East Asian crisis in 1997, Russian crisis in 1998, and Brazilian crisis in 1998/1999. For each new crisis, a new and in general more sophisticated model is developed, an evidence that speculative activity in foreign exchange markets is difficult to model as Krugman (Ibid.) recognizes.

3. A POST KEYNESIAN APPROACH ON FINANCIAL INSTABILITY AND SPECULATIVE ATTACK IN AN UNCERTAIN WORLD[7]

3.1. Financial markets and speculative activity in a nonergodic world

Keynes and Post Keynesians reject the classical ergodic axiom of efficient market theory to explain the financial market behavior. This is so since in an uncertain world future market valuations are always uncertain because the future is subject to sudden and violent changes and fundamentals do not provide a reliable guide to the future[8]. In such a world, speculation is not an anomaly but it results from the operational way in which financial markets work!

In different works, Keynes separated uncertainty from probable events, especially in relation to decisions involving the accumulation of wealth and the possession of liquidity. By uncertainty, he meant that "human decisions affecting the future, whether personal or political or economic, cannot depend on strict mathematical expectation, since the basis for making such calculations does not exist" (Keynes, 1964:162-3), which means "there is no scientific basis on which to form any calculable probability whatever. We simply do not know" (Keynes, 1973:114).

Therefore, Keynes rejected the belief that some observed economic phenomena are the outcome of any stochastic process, because for some occurrences, agents do not possess adequate information to construct useful future probabilities. The future is not calculable nor is the statistical reflection of the past, since, as Davidson (1994:89) points out, "the decision maker believes that during the lapse of calendar time between the moment of choice and the date(s) of payoff, unforeseeable changes can occur. In other words, the decision maker believes that reliable information regarding future prospects does not exist today".

It is because uncertainty exists that future market valuations are neither predictable nor calculable by probability. Economic agents in financial markets have heterogeneous expectations, once one can never expect whatever data sets exist today to provide a reliable guide to future outcomes. In this sense, expectations that drive spot financial market are not rational, because the conventional valuation based on psychological forecasting of the market cannot be statistically

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[7] Sections 3.1 and 3.2 are an adaptation of Alves, Jr. *et alli* (1999/2000).

[8] See, particularly, Keynes (1964, Chapter 12) and Davidson (1997, 1998).

reliable. Therefore, financial markets cannot be presumed to be efficient in the sense stated by efficient market theory (Davidson, 1998).

In the Post Keynesian view, the axiom of money neutrality does not work, because in a world under incalculable uncertainty, money – as the object that liquidates contractual commitments denominated in the money account – can be held as a safety asset in moments of greater uncertainty by its characteristic of transporting purchasing power over time[9]. So liquidity preference can grow if entrepreneurs and speculators have contractual obligations and there is some degradation in the state of confidence. As the state of confidence is subjective, there is room for diversity of opinions about the future. And, if there is diversity of opinions and organized markets designed to give liquidity to assets, then there will be several opportunities for speculative activities to emerge.

According to Kaldor (1980), speculation is the act of purchasing an asset with the intention of reselling it latter, at higher prices, in the expectation of favorable changes taking place in the concerned markets. The role of the speculator is essential in these markets, because he/she can take the risks of acting against the market in anticipation of future movements in the price of assets; *i.e.*, his/her behavior can stabilize or not the price of assets, depending on the range of price oscillations. As the spot markets for existing stock of assets determine their liquidity attributes, the presence of speculators operating in organized markets creates the possibility of disposing of assets, that are the content of the liquidity premium.

Keynes showed, in his *The General Theory of Employment, Interest and Money* (hereafter referred to as *GT*), that investor and speculator expectations are not governed by real fundamentals in the long-run related to a prospective yield of an investment over a long term of years, but for what the market will currently value the asset, trying to anticipate the basis of conventional valuation in a few months hence. In his words, "for most of these persons are, in fact, largely concerned, not with making superior long-term forecasts of the probable yield of an investment over its whole life, but with foreseeing changes in the conventional basis of valuation a short time ahead of the general public. They are concerned, not with what an investment is worth to a man who buys it 'for keeps', but with what the market will value it at, under the influence of mass psychology, three months or a year hence" (Keynes, 1964:154-5).

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[9] This idea is clearly developed in Keynes (1964, Chapter 17) and Davidson (1994, Chapter 6).

Speculation is essentially an activity of forecasting the psychology of the market. Under an entrepreneur economy[10], the organization of financial markets needs to face a severe trade-off between liquidity and speculation, as Keynes has pointed out in Chapter 12 of the *GT*. The primary function of financial markets is to provide liquidity, which involves the ability to buy and resell assets in a well-organized market, where financial assets can be readily resold for cash. As markets give liquidity to assets, this characteristic facilitates the use of these assets to finance the investment as soon as they can encourage savers to provide the necessary funding that stimulates investors to spend their monetary resources on new investment projects[11].

As speculators dominate financial markets, short-run practices provide the rhythm of assets prices. Financial market stability requires a larger number of speculators with different opinions (bull and bear expectations). However, although the liquidity of financial markets often facilitates, it can sometimes impede the course of a new investment, because "with the development of organized investment markets, a new factor of great importance has entered in, which sometimes facilitates investment but sometimes adds greatly to the instability of the system. In the absence of security markets, there is no object in frequently attempting to revalue an investment to which are committed" (Ibid.:150-1). Therefore, there is a dilemma involving speculative activity "for the fact that each individual investor flatters himself that his commitment is 'liquid' (though this cannot be true for all investors collectively) calms his nerves and makes him much more willing to run a risk. If individual purchases of investments were rendered illiquid, this might seriously impede new investment, so long as *alternative ways* in which to hold his savings are available to the individual" (Ibid.: 160).

Keynes and Post Keynesians state that there are close connections between financial and real sectors. One of these connections is the impact of speculative activity on productive activity, especially on investment. According to Keynes, "if I may be allowed to appropriate the term *speculation* for the activity of forecasting the psychology of the market, and the term *enterprise* for the activity of forecasting the prospective yield of assets over their whole life, it is by no means always the case that speculation predominates over enterprise" (Ibid.:158), but "the position is serious when enterprise becomes the bubble on a whirlpool of speculation.

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[10] Keynes's concept of an entrepreneur economy is developed in his article "The distinction between a co-operative economy and an entrepreneur economy" (Keynes, 1979:76-87).

[11] See, for example, Carvalho (1995) for a discussion on functionality and efficiency of the financial system in a Post Keynesian approach.

When the capital development of a country becomes a by-product of the activities of a casino, the job is likely to be ill-done" (Ibid.:159).

Since speculators valorize liquidity and create their expectations based on what will be the others expectations about the future (market medium price of assets), an expected shift in the liquidity preference will be transferred to financial markets as an increase in the seller orders, that may cause a great decrease in prices of assets. Market makers have a strategic role in stabilizing markets, because they act against the market tides, as residual operators. Thus, they are speculators that know better where the market will ultimately head to. If there are no safeguards like a lender-of-least-resort or another kind of market maker, the market system by itself does not have an automatic reverting price system able to stop these movements. Of course, there are large real implications of a continuous decrease in asset prices, especially in the case of investment and on the financial structure validity[12].

As volatility is a consequence of speculation, markets must be organized in order to limit price fluctuations that include continuous assets selling others. This must be done by the establishment of access rules to the participants of the financial market, and mainly by the presence of a powerful market maker. Only these rules are able to inhibit great speculation effects. In other words, a specific institutional design of a financial market determines its potential as an environment where speculation can flourish.

3. 2. Financial globalization and speculative attack

Keynes (Ibid.:158), making reference to one of the greatest investment markets in the world, New York, stated that "as the organization of investment markets improves, the risk of the predominance of speculation does, however, increase". This seems to be the case of today's increase of financial globalization: under the action of "global players" (big fund managers), in a more liberalized and integrated market, the operational way of working of the financial markets became a sort of big and global casino. The high capital mobility of today's global economy has increased the arbitrage and speculative transactions in foreign exchange. As Davidson (1997:671) points out, "even in the absence of reliable information, rapid evaluations of the potentials effects of any event on exchange rates and hence on portfolio value are essential as rival market participants can move funds from one country to another in nanoseconds with a few

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[12] See, for instance, Davidson (1994) and Minsky (1982, 1986).

clicks on the computer keyboard or a quick telephone call to some international market at any time of day or night".

In contrast with closed financial markets of yesterday, capital flows can have disruptive action on countries, damaging the autonomy of domestic macroeconomic policies, and even generate speculative attacks on domestic currencies. As Eichengreen, Tobin & Wyplosz (1995:164) state, "volatility in exchange rates and interest rates induced by speculation and capital flows could have real economic consequences devastating for particular sectors and whole economies". Here emerges what we can call "dilemma of the globalization": while the financial globalization increases the opportunities of investment finance, with the diversification of financial instruments (securitization, derivatives, and so on)[13], at the same time this trend can generate negative real economic consequences, which can involve the collapsing of investment decisions.

In such a world, self-fulfilling attack can defeat the governmental attempt to peg the exchange rate, resulting in a currency crisis. In Davidson's words (1997:671-2), "in today's global economy any news event that fund managers even suspect that others will interpret as a whiff of currency weakness can quickly become a conflagration spread along the information highway. This results in lemming-like behavior that can be self-reinforcing and self-justifying". A currency crisis can happen even when a government is prepared to maintain a pegged exchange rate once it may be unwilling or unable to do so when attacked by the speculators. On the other hand, *contagious* crisis can occur so that an overall fall in the asset prices of a certain financial market may provoke sales of assets in another market to compensate the losses in the portfolio of great operators, "global players", and this can cause successive rounds of asset sales.

In general, speculative attacks result from the actions of people and institutions with the use of large amounts of money, landed by resident banks, to acquire call options or futures, at a contractual exchange rate lower than the exchange rate they are expecting for the near future. The expected rate can be the result of a fundamental analysis, but can also be done on the basis of an expectation of what other speculators will think about the future of exchange rate. Again, it will depend on the characteristics of each market; therefore, it is necessary to know what kind of rules will limit or promote the access to financial and capital markets, and the quality of the market maker.

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[13] For an analysis about the recent trends of financial globalization, see, particularly, Carvalho (1997).

If the markets – especially the exchange market – have a liberalized access to speculators and they can borrow or get a great amount of local money, the institutional conditions for the beginning of a speculative attack arises. Since their recent financial liberalization, emergent countries in Latin America, Eastern Europe and Asia began to receive a massive influx of foreign capital that could be reconverted in foreign currency without legal constraints. Moreover, in a context which dollars are emitted exclusively by the United States, a non-United States country market maker has limited power to support a fixed currency.

A speculative attack can start once speculators believe that someone can convert their resources in foreign currency and the government is not able to support the total demand for foreign currency. Nevertheless, it is impossible to explain *ex ante* the exact moment of the attack, because, as Keynes pointed out, speculation is essentially an (subjective) activity of forecasting the psychology of the market. Besides, institutional arrangements of global era, since the end of Bretton Woods system, do not prevent the economies from speculative attacks. A speculative attack over a country's reserves is *always* possible in case of absence of a strong market maker and rules that can be used to control speculators actions. In a global and nonergodic world, microeconomic fundamentals are not necessary to explain this sort of behavior.

Mainstream, as we have seen above, attributes currency crisis to any sort of informational failure or irrationality. Crisis and volatility do not result from endogenous economic variables, but from exogenous ones. In a Post Keynesian view, alternatively, the presence of uncertainty makes possible seeing the instability as an endogenous phenomena, mainly in the case where markets participants are free to do what they want. In a global and uncertain world we cannot understand financial instability and speculative attack as "anomalies". On the contrary, they are expected and possible outcomes that emerge from the operation of global financial markets in a nonergodic system where there is not a safeguard framework that exerts the role of an overall market maker.

3.3. A note on currency crisis in conditions of normality and instability

In spite of using the Wicksellian concept of *natural equilibrium*, a state or point determined by current *objective* conditions like preferences and technology, where the economy, sooner or later, will settle, Post-Keynesian economics suggests that *normal equilibrium* is a more relevant concept that reconciles uncertainty and agents' subjective evaluations of economic futures and economic stability. So, what really matters in explaining the actual path taken by the eco-

nomy is the "state of long-term expectations" rather than "objective" long-period conditions[14].

The concept of *normality*, as derived from Keynes, relates to the existence of rules, conventions and institutions that guarantee continuity in economic activity, despite the fluctuations and interruptions that are also typical of capitalism[15] Normality is associated with repetitive facts and events that can be observed frequently, and may thus be foreseen. In a state of economic normality, average behavior prevails in the economy. Providing the behavioral parameters are stable, the macroeconomic context can be predicted with some confidence. Continuity is guaranteed by exogenous factors, such as psychological factors and those relating to the environment[16]. These factors are responsible for the fact that the capitalist economy shows a remarkable degree of stability. On the other hand, normal conditions may also be disrupted by exogenous factors that cause a break with current rules, conventions and institutions, producing deterioration in agents' state of confidence and a change in their behavior. In conditions of instability, there are neither regular and repetitive behavioral trajectories nor normal behavior that can be foreseen by the agents.

In the context of a country's external economic relations, the concept of normality relates to agents' state of confidence in the maintenance of certain practices (for instance, in the government's ability to maintain the existing exchange regime or to control the economic fundamentals) and also to resident and non-resident agents' belief in the long-term sustainability of the balance of payments (for instance, a country's ability to finance its current account deficit, an increase in the relative share of long-term capital in overall capital inflows, or an expected improvement in the balance of trade). Agents will take this picture as their frame of reference when forming their expectations.

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[14] In this connection, see Carvalho (1992, Chapter 2).

[15] According to Keynes (1964:249), "it is the outstanding characteristic of the economic system in which we live that, whilst it is subject to severe fluctuations in respect of output and employment, it is not violently unstable".

16 "As important as the 'right' psychology are the features of the environment that strengthen continuity. Foremost among these features are institutions created to reduce or socialize uncertainty, coordinating plans and activities. The most important of them is the emergence of forward contracts denominated in money connecting the present to the future" (Carvalho, 1992:27-8).

However, during periods of instability and crisis, a currency crises can be caused by deterioration in agents' expectations due to a change in external factors (differentials between domestic and foreign interest rates, an external shock, or some weakness in the exchange rate) and/or by a break with conventions that leads agents to lose faith in the government's ability to sustain a certain exchange regime. In this context, a sharp, continuous fall in the level of foreign reserves that normally serve as a hedge against speculative attacks is an indicator that an external crisis prevails. *The currency crisis is associated with the dissolution of the context of normality and deteriorating expectations among agents as regards this context, as they lost confidence in the government's ability to maintain this regime and to sustain the balance of payments.* Immediately after the crisis, the new behavior by agents can lead to expectations that external financial shocks may occur with greater intensity and frequency. In these conditions, the economic agents require that the country offer a broader spread in interest rates to attract capital or to avoid further capital outflows, but this does not guarantee that a currency crisis will be avoided.

4. AN ANALYSIS ON 1998/1999 BRAZILIAN CURRENCY CRISIS

4.1 Brazilian currency crisis: some facts and data[17]

The recent evolution of foreign variables and their effects on the Brazil's external vulnerability seems to point to five important periods in the evolution of the Brazilian economy: (1) the period running from the second quarter of 1992 until the end of the second quarter of 1994, where there was the existence of trade surpluses; (2) the period from the third quarter of 1994 until the first quarter of 1995, running from introduction of the new currency – the *real*[18] - and the sub-

[17] This section is an adaptation of Paula & Alves, Jr. (2000). The data were extracted from the Table 1.

[18] The Real Plan was conceived on the same basis as stabilization programs with exchange anchor that have been applied in Latin America since the late 80s, using a fixed or semi-fixed rate of exchange in combination with more open trade policy as a price anchor. It differs from Argentina's Convertibility Plan by adopting a more flexible exchange anchor; that is, a typical currency board system, rather than pegging the domestic currency at one-to-one parity with the U.S. dollar. At the outset of the Brazilian program, in July 1994, the government's commitment was to maintain an exchange rate ceiling of one-to-one parity with the dollar. Moreover, the relationship between changes in monetary base and foreign reserve movements was not explicitly stated, allowing some discretionary leeway. After the effects of the Mexican crisis, the exchange rate policy was reviewed and in a context

stantial liberalization of imports and ending with the Mexican crisis and the resulting *Tequila effect*; (3) the brief period in which external vulnerability went into decline, ending in the third quarter of 1995, when the trade balance made a rapid and short-lived recovery; (4) the period from the last quarter of 1995 to the fourth quarter of 1997, marked by large trade balance and services deficits, and at the end of the period, by the effects of the East Asian crisis on Brazil; and (5) a final period from the first quarter of 1998 until the second quarter of 1999, characterized by macroeconomic instability in which Brazil – after a short and apparent recovery from the East Asian crisis – was affected by the Russian crisis, resulting in a sharp outflow of short term capitals that led the crawling exchange rate band to be abandoned early in 1999.

During the first period, the trade balance was always positive, reflecting competitiveness in production of the nation's tradables, due largely to the depreciated real exchange rate in relation to the present day, as a result of the rule of mini-devaluations adopted at the time. Investments in portfolio were already quite significant in this period, probably attracted by the possibility of carrying out "box operations", which made it possible, by using the derivatives market, to simulate the environment of fixed income applications – which offered international investors significant real interest rates[19].

At the same time, one can observe significant growth in medium- and long-term loans and foreign direct investment. As a result of the major influx of foreign capital into Brazil during the period, the volumes of reserves increased considerably, jumping from US$13,700 million in the first quarter of 1992 to the region of US$ 40,000 million in the second quarter of 1994. Meanwhile, short-term capital movement oscillated, with sizeable net outflows until the end of the fourth quarter of 1993 and accelerating growth in net inflows from then until the end of the second quarter of 1994. There was practically no increase in the stock of this short-term capital in the period.

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of a crawling exchange rate band the nominal rate began to undergo gradual devaluation. In early 1999, however, after six months of speculative pressure, the *real* was devalued and, some days later, the Brazilian government adopted a floating exchange rate. For a general analysis of the origins and development of the Real Plan, see Silva & Andrade (1996).

[19] The nominal interest rate divided by the exchange devaluation in the period gives the foreign investor's return in terms of the foreign currency. "Box operations", in turn, by way of a mixture of operations on the spot and derivatives markets, allow international investors in Brazil to obtain returns on the variable income market similar to those of the fixed income market by exploiting the tax advantages granted to foreign investment under the provisions of Annex IV, according to the Resolution 1,289 of the National Monetary Council, set up on May 31, 1991.

With the introduction of the new currency – the *real*, which rapidly appreciated over levels of the previous period due to the combination of a policy of high primary interest rates with an "asymmetrical exchange band"[20] – and with the freeing up of imports as of September 1994, the tendency towards trade balance surpluses was abruptly inverted. At the same time, the balance of services showed larger deficits, mainly as concerns non-financial services, with special mention for international travel, insurance and freight. On the other hand, in the first quarter of 1995, portfolio investment, medium- and long-term loans and direct investment fell sharply by around US$ 11,000 million as compared with the previous quarter, with the onset of the Mexican crisis, probably because of its effects on non-residents' expectations as to the liquidity and profitability of their investments. Net inflows of short-term capital behaved erratically in the period, holding to a high plateau at first, falling sharply at the end of 1994 under the *Tequila effect* and then continuing to grow in the first quarter of 1995, which indicates that this type of capital is more sensitive to changes in government monetary policy and to expectations of a currency crisis.

One of the final results of these movements in this period was a major reduction in Brazil's reserves, which shrank to 75.0% of their initial volume between the beginning of the Real Plan and the end of the first quarter of 1995, increasing the external vulnerability of Brazilian economy[21]. As of March of that year, under the impacts of the Mexican crisis and Brazil's deteriorating trade balance, a new stage began in terms of economic policy characterized by greater flexibility in exchange and trade policy, with the introduction of a system of mini exchange bands and the raising of import taxes to 70.0% on 109 product items, including

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[20] According to Bacha (1997:181), in the terms of the "asymmetrical exchange band", the Central Bank undertook to intervene should the Real tend to devaluate against the dollar beyond its 1:1 parity, but would leave the market free should the tendency be for the Real to appreciate against the dollar.

[21] External vulnerability may be defined as the degree to which an economy is vulnerable to changes in conditions of financing originating from alterations in external interest rates or in exchange rates. This fragility may manifest itself in operational terms, which, from the macroeconomic viewpoint, would entail trade balance deficits. In terms of financing, however, if there are units with financing in foreign currency at shorter-term maturities than the activity financed and/or whose revenues are in domestic currency, they may be vulnerable to changes in exchange rates, at the same time as the country is subject to external shocks deriving from alterations in international financing conditions. Our view on this subject is developed in Paula & Alves, Jr. (2000).

automobiles and household electrical appliances[22]. At the same time, the Government increased the primary interest rate sharply, which was fundamental in securing a significant volume of foreign funds by stimulating absorption of short-term capital.

In the third period, beginning in the second quarter of 1995, as a result of the change in exchange and trade policy and the adoption of strong "containment" economic policy measures (higher interest rates and limitations on credit), the trade balance steadied: exports – which had fallen off considerably in the first quarter of 1995, probably because of expectations of an exchange devaluation - began to grow, while imports began to level off. The fundamental fact, however, is that direct investment, medium- and long-term loans and portfolio investment increased substantially, as did short-term capital, the net inflow of which exceeded US$ 11,000 million in the period, demonstrating the Government's success in confronting the *Tequila effect* and regaining agents' confidence in the Real Plan. With this, reserves recovered rapidly, jumping from US$ 31,500 million in the second quarter of 1995 to US$ 46,600 million in the third quarter. The rapid replenishment of reserves and the influx of direct investment and medium- and long-term loans were decisive in reducing the Brazilian economy's external financial vulnerability at that point.

In the fourth period, beginning with the fourth quarter of 1995, the behavior of the trade balance did not repeat the surpluses of the previous phase, but held steady or declined slightly until the second quarter of 1996, then decreased rapidly to reach its lowest value in the last quarter of 1996 (a deficit of around U$ 3,000 million), as a result of a combination of a relative stagnation of exports with a sharp increase in imports, which began to grow again vigorously. This behavior resulted from renewed economic growth in Brazil, in the context of a more expansionist economic policy, and also the ineffective non-exchange measures adopted to bolster exports, in addition to falling prices of some of Brazil's export commodities on international markets.

In this period, in addition to the influence of short-term capital, spending on non-financial services also contributed to driving the external vulnerability upwards, especially as a reflex of increased spending on freight and international travel, in the latter case strongly stimulated by the rising exchange rate and credit card facilities for financing purchases. On the other hand, interest and amortiza-

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[22] As of March 1995, the Government changed its exchange policy, carrying out a nominal devaluation of the *real* of about 6% and coming to adopt a policy of small monthly devaluations – by a slowly sliding, narrow exchange band – which was maintained until the beginning of 1999.

tion spending, a product of the accumulated stock of medium- and long-term loans, has been growing since early 1996 although, in the case of amortizations, spending oscillated considerably during the period. The variables that performed well in this period were medium- and long-term loans and direct investment.

The speculative attack on the *real* in October 1997 caused a significant reduction in short-term capital and in the levels of Brazil's foreign reserves, and highlighted the external fragility of the *real.* A currency crisis was prevented only by swift action from the Government, which sold off part of its voluminous international reserves (that fell from US$ 61,200 million in September 1997 to US$ 51,400 million in December 1997), raised annual interest rates sky-high (from 21.0% to 44.0%) and increased the supply of hedge financing by selling exchange-adjusted government securities, so as to revert the speculative p|rocess under way at the time. In addition, the Brazilian government announced a strong fiscal policy package and measures to attract capital inflows. However, disappointment with slippage in fiscal adjustment in 1998 and the continuous growth of the public debt contributed to the sentiment that Brazil remained vulnerable. This sentiment was due to the loss of government capacity to improve the economic fundamentals, in particular the public sector deficit: the Brazilian government had promised a strong fiscal adjustment, but did not fulfill its promise. After the devaluation in mid-August 1998, the crisis in Russia led quickly to pressures on emerging markets and affected particularly Brazil's external capital account[23]. Again, as the outflow of capital continued throughout the second semester of 1998, the Brazilian government's response in October and November 1998 was to raise interest rates sharply (to 42.2% per year in late October), to increase the supply of hedge financing by selling exchange-adjusted Government securities and to announce a strong, front-loaded fiscal adjustment effort[24], while maintaining the current exchange rate regime. To reinforce these measures – and considering that they did moderate the rate of outflow of

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[23] Liquidation of Brazilian Brady bonds to cover losses on Russian securities and, more generally, the build-up of short positions in Brazilian offshore debt instruments, resulted in arbitrage by resident investors seeking the higher return on the "Brazil risk" offered by Brady bonds. Non-resident holdings of Brazilian debt and equity instruments were also significantly reduced, and capital outflows by residents took place in other forms. Overall, most of the outflows were by non-residents. For an analysis of Brazilian crises, see IMF, *World Economic Outlook*, December 1998, particularly Box 1.1.

[24] The Brazilian government announced a front-loaded three year fiscal adjustment program, that included a series of expenditure-saving and revenue-raising measures, with the intention to produce primary surpluses of the consolidated public sector – equivalent to 2.6 percent of GDP in 1999, 2.8 percent in 2000, and 3 percent in 2001 – sufficient to stabilize the ratio of the public debt to GDP by the year of 2000.

sidering that they did moderate the rate of outflow of reserves, although not halting it altogether – the Brazilian government received a US$ 41,000 million IMF-led financial assistance package in support of its program of adjustment, considered as being a program of a "preventive nature"[25]. Nevertheless, as it was not at all clear how the proposed pre-approval would work in practice, given that the IMF conditions were onerous and complex, and considering that the IMF's image had deteriorated since the failure of its intervention in East Asia, the IMF loan package was not able to restore confidence on the financial markets that Brazil would be able to defend its currency[26]. So, when it became evident that foreign lenders and investors would not return until the exchange rate had been adjusted, Brazil was forced to allow its currency to float in January 1999.

So, the fifth and final period of our analysis, beginning with the speculative onslaught of October 1997, was characterized by macroeconomic instability, marked by strong pressures on Brazil's domestic currency that resulted in a maxi-devaluation of the *real* and the change in the exchange regime, from the crawling exchange rate band to a floating exchange regime in January 1999 This decrease was initially due to a sudden, sharp contraction in short-term capitals and investments in portfolio (around US$ 8,000 million), as well as a decrease in amortization (around US$ 9,000 million), that resulted in a US$ 9,800 million reduction in foreign reserves during the fourth quarter of 1997 alone. After its successful defense of the *real*, the Brazilian government partially restored foreign investors' confidence, since capital outflows were stanched during the first semester of 1998. The Brazilian economy regained a sort of "appearance of normality", as was evidenced by the fact that foreign reserves reached the level of US$ 70,000 million at the end of June 1998 (compared with US$ 40,000 million at the beginning of the Real Plan in July 1994).

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[25] Of the total amount, US$ 18,100 million would be provided by the IMF in the form of a three-year Stand-by Arrangement, about US$ 14,500 million from 20 governments channelled through, or provided in collaboration with, the BIS. However, only the first tranche of US$ 5,300 million from the IMF became available after approval of the package by the IMF's Executive Board on December 2, while the other tranches would be available during 1999, subject to enactment of the key fiscal measures and the completion of a review by the IMF Executive Board.

[26] East Asian crises were a typical "debt deflation process" and in this circumstance the adoption of conventional policies, treating the currency crises as balance of payment crises, only deteriorated the crises in East Asia. See, in this connection, Kregel (1998). For a critical overall assessment of recent IMF policies, see Feldstein (1999).

However, during the second half of 1998 and the first quarter of 1999, when the Brazilian economy suffered the knock-on effect of the Russian crisis, there was a sharp capital outflow from Brazil (a net outflow of US$ 33,700 million, including short-term capitals and investments in portfolio), resulting in a drop of around US$ 37,000 million in foreign reserves during this period, with the stock of reserves reaching the level of US$ 32,800 million in the first quarter of 1999, lower than the level at the beginning of the Real Plan. This fact put an end to the notion that the high level of reserves served as a "shield" for the *real*. The single factor that offset the capital outflow was foreign direct investment that remained at high levels throughout the period, mainly as a result of the privatization programs and acquisition of domestic firms by transnational enterprises. During the second quarter of 1999, after the change in the exchange regime, the capital outflow diminished, resulting in a slight improvement in foreign reserves from US$ 32,900 million to US$ 40,400 million. Capital outflow slowed but did not stop. This behavior is typical of a period of currency and/or external crisis.

4. 2 Brazilian currency crisis: an interpretation

The speculative attacks on the *real* that occurred in October 1997 and during the second semester of 1998 seem to have stemmed from a mix of a "contagion crisis" arising from the effects of the East Asian and Russian crises on Brazil and an outbreak of speculative activity triggered by market operators who perceived clear macroeconomic imbalances in Brazil. The contagion effect became evident in the fall in the price of bonds issued by Brazil (and all emerging countries) and traded on international financial markets and also in the losses taken by global players in their applications on East Asian and Russian stock markets, both contributing to investors on the Brazilian market selling their positions in *reals* to cover their losses on other markets.

In fact, the Russian moratorium not only produced large losses for major Western financial institutions, but also led them to sell assets in emerging markets to raise funds to cover theirs losses, thus creating an outflow of capital from those markets. This affected Brazil in particular because the markets for Brazilian equities and Brady bonds are among the largest and most liquid of emerging markets, and play important roles in global arbitrage strategies. On the other hand, the perception on the international financial market was that the Brazilian economy had features in some way similar to that of Russia: a large and growing public sector deficit, an exchange-based stabilization policy, real appreciation and rising foreign deficits sustained by large short-term capital inflows based on interest rate differentials, and vulnerability to commodity price declines.

In terms of doubtful economic fundamentals, the unsustainable trend in its foreign accounts placed Brazil at risk of a currency crisis, because of the high degree of external financial fragility of the Brazilian economy, which left it susceptible to short-term changes in the international situation. As we show in Paula & Alves, Jr. (2000), there is clear evidence that the degree of Brazil's external financial fragility increased during the Real Plan, principally in 1996 and 1997, basically because exchange liabilities – actual and potential – were not covered by current revenues and sources of longer-term financing, which has left Brazil systematically dependent on external refinancing.

The economic authorities seemed to neglect the effects of a possible change in the international situation, while putting across the idea that the *real* was a bulwark. The central idea was that the large trade deficits that could be observed were the result of the process of restructuring industrial production in Brazil, which promised productivity gains sufficient, in the medium-term, to offset exchange appreciation. The exchange risks of this strategy would be minimized by the fact that the deficit was claimed to be soundly financed, with growing participation by long-term foreign capital. In addition, the high level of foreign reserves was considered a "shelter" against any attempted speculative attack again the Brazilian currency, the *real*.

Nonetheless, events in Brazil demonstrated that, in view of the increasing current account deficits, long-term financing for these deficits was insufficient to preclude external vulnerability. Brazil was thus obliged to resort to external refinancing, which contributed to increasing the already voluminous stocks of bonds and credits with short maturities, leaving the Brazilian economy more and more vulnerable to shifts in the short-term expectations formulated by foreign investors. *The Brazilian currency crisis was directly associated with the dissolution of the context of normality that had prevailed since the beginning of the Real Plan and agents' deteriorating expectations in relation to this context, as a result of a loss of confidence in the Government's ability to maintain this regime and in the sustainability of the balance of payments*[27]. The IMF-led financial assistance

[27] In the case of Brazil, the normality as regards the external context during the Real Plan was closed associated with the strong belief among resident and non-resident agents in the stability and maintenance of the exchange rate regime (the "crawling exchange rate band"), including the Government's ability to maintain this regime, and also in the sustainability of the balance of payments. This belief created a macroeconomic context in which a sort of "convention of stability" prevailed, so that economic agents believed in the macroeconomic sustainability of the price stabilization policies. On the other hand, the currency crisis was associated with the dissolution of the context of normality and deteriorating expectations among agents as regards this context, as they lost confidence in the Government's ability to maintain this regime and to sustain the balance of payments.

package, shaped to be a program of a "preventive nature", was not able to restore confidence on the financial markets that Brazil was able to defend its currency, given that not only the IMF conditions were onerous and complex, but also that the IMF's image had deteriorated since the failure of its intervention in East Asia. Repeated financial crises – East Asian and Russian – in a very short period of time and the international recession of 1997/1998 also contributed to deteriorating the Brazilian economy.

5. CONCLUSION

As it was shown in this article, from a Post Keynesian perspective, speculative attacks and currency crises, in a non-ergodic world, result from: (i) the operational way in which financial markets work in a global world, where there is no enough safeguard framework that exerts the role of an overall market maker; (ii) the deterioration in agent's expectations due to a change in external changes and/or by a break with conventions that leads agents to lose faith in the government's ability to sustain a certain exchange regime, or, in other others, currency crisis is associated with the dissolution of the context of normality and the deteriorating expectations in this context. If there is not a strong exchange market institution to prevent the volatility of financial and capital markets, basically due to the fact that the financial and exchange markets were liberalized in emergent economies in the 1980s and 1990s, the speculators manipulate a great amount of local money and, as a result, a speculative attack can arise. Thus, from this point of view, differently from the conventional wisdom, financial speculation is not an "anomaly", explained, for instance, by the existence of foolish "noise traders", but it is a consequence of the operational way in which financial markets work in the real world!

Analyzing the Brazilian currency crisis, we observed it was associated with the dissolution of the context of normality that had prevailed since the beginning of the Real Plan and agents' deteriorating expectations in relation to this context, as a result of a loss of confidence in the Government's ability to maintain the exchange regime and the sustainability of the balance of payments, after Russian crisis. In other words, the Brazilian currency crisis resulted from the attempt to introduce sustainable policies in a context of completely free capital markets. Kregel (1999:26), among others, emphasizes this point: "the main similarity of recent financial crises [East Asian, Russian and Brazilian crises] is that they appear to have been initiated by a sharp reversal in capital inflows that seems to be generated by an endogenous process of deterioration of economic conditions caused by the capital that has flowed into the country in response to successful application of internal stabilization policies [...] so, successful stabilization policy

carries the seeds of its own destruction in the form of excessive capital inflows to take advantage of the return differentials".

Let us conclude this article by arguing that in a global world the real disruptive outcomes derived from the speculative in liberalized financial markets will be *only* reduced (or eliminated) if we have a market maker institution able (i) to prevent the capital volatility, (ii) to assure market price stability, and (iii) to promote full employment economic growth. This is the main lesson of Keynes' ideas.

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Table 1
External variables of Brazil, from I/92 to II/99 (US$ Million)

Quarter	X	M	Ri	Di	Ros	Dos	A	STC	RE	NIP	FDI	Lml
I/92	7.860	4.654	218	2.469	1.130	1.784	(2.656)	567	13.741	1.333	1487	2156
II/92	8.647	4.725	269	1.325	990	1.924	(1.166)	90	18.109	1.947	850	3242
III/92	9.525	5.227	251	3.146	954	2.213	(1.827)	(968)	17.682	2.104	224	1780
IV/92	10.071	5.972	304	1.425	903	2.039	(1.498)	(870)	19.008	2.281	275	2129
I/93	9.454	5.206	280	3.281	1.109	2.495	(2.189)	(1.290)	17.960	3.285	302	1661
II/93	.246	6.044	257	1.806	996	2.679	(2.262)	(1.647)	18.814	4.007	135	3133
III/93	10.371	7.400	188	1.755	1.070	2.895	(2.467)	(1.368)	20.116	5.366	186	3054
IV/93	9.873	7.050	91	2.427	1.273	3.187	(2.643)	(553)	25.878	8.931	388	3737
I/94	8.877	6.049	286	1.775	1.320	2.883	(2.760)	1.408	32.295	11.455	659	2270
II/94	11.225	7.088	457	2.226	1.223	2.864	(2.509)	4.286	40.131	13.026	670	2396
III/94	12.182	8.023	478	1.329	1.267	3.366	(2.667)	3.002	40.873	13.364	424	2640
IV/94	11.275	12.007	580	2.810	1.246	4.178	(3.051)	(449)	36.471	14.611	488	4304
I/95	9.731	12.065	684	1.789	1.534	4.563	(2.762)	4.966	31.530	10.989	711	918
II/95	11.718	13.651	552	3.652	1.704	4.141	(3.189)	7.176	31.492	12.268	663	4317
III/95	12.729	11.917	534	1.797	1.666	4.252	(2.217)	16.283	46.614	16.121	811	5.264
IV/95	12.328	12.030	715	3.405	1.712	3.864	(2.858)	19.218	50.449	16.905	1.100	4.238
I/96	10.286	10.738	618	2.485	1.945	3.921	(4.120)	22.087	54.331	18.782	1.221	3.946
II/96	12.617	12.477	627	3.550	2.217	4.414	(2.835)	22.017	58.639	19.786	3.256	6.301
III/96	12.955	14.235	762	2.563	2.002	5.545	(3.114)	23.581	57.381	21.031	1 385	3.527
IV/96	11.889	15.837	911	4.160	2.081	6.232	(4.355)	25.304	59.039	22.944	3 718	9.028
I/97	10.656	13.132	1 048	2 017	1 607	5 483	(2.963)	24 623	58.120	25.843	2 752	3 279
II/97	14.130	15.409	933	4 468	2 306	6 190	(8.423)	20 211	56.795	29.126	4 237	8 474
III/97	14.899	16.929	1 118	2 732	2 217	6 717	(4.322)	13 510	61.161	31.012	4 462	8 927
IV/97	13.301	15.888	922	5 192	2 294	6 934	(13.049)	7 788	51.359	28.244	6 413	8 190
I/98	11 901	13 413	981	2 503	2 365	5 507	(3 982)	7 670	67 772	33.031	3 171	14 817
II/98	14 067	14 557	1 010	4 702	2 245	6 329	(6 613)	2 332	70 060	36.495	5 849	10 100
III/98	13 492	15 270	1 107	3 236	2 364	7 613	(10 947)	(12 855)	44 986	27.781	9 337	7 382
IV/98	11 660	14 633	797	5 402	2 353	6 728	(12 045)	(19 546)	43 617	26.392	8 158	9 374
I/99	10 042	10 862	526	3 384	2 267	4 413	(18 212)	(21 333)	32 873	26.544	7 204	2 707
II/99	12 404	12 200	513	5 409	2 031	4 895	(10 953)	(23 407)	40 417	27.554	5 054	10 301

Source: Monthly Bulletin of Brazil's Central Bank, various issues. Note: STC and NIP are aggregated since the first quarter of 1991.

M= imports; *X*= exports;*D*= expenditures on interest "i" and other services (OS); *R*= revenues from interest "i" and other services (OS); *A*= loan amortizations;*STC*= short-term capital stock;*NIP*= stock of net investment in portfolio, with a quarter-year lag; *RE*= aggregate official reserves at prior quarter-year end; *FDI*= foreign exchange inflows corresponding to direct investments;L_{ml}= medium- and long-term loans.