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THEORETICAL ASPECTS OF MONETARY AND FINANCIAL CRISES. SPIRAL OF LOSSES

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Abstract: *One of the many issues associated with financial crises is related to interest rate policies during and after the crisis. A pertinent opinion is given by Christiano, Braggion and Rodlos (2006), that increased interest rates during the crisis, corroborated with immediate decrease post-crisis is the best handle on such a situation.*

Financial institutions fund new investments with loans and borrowed funds. Consequently, nowadays' financial system looks more like a complex network of financial obligations. With the addition of modern financial techniques such as bonds and options, institutions have more funding options than ever.

Herein fro, a series of theoretical aspects regarding monetary and financial crises are presented, alongside choices of corresponding macroeconomic models and causes of the Great Depression of 1929-1933.

The paper concludes with an explanation regarding spiraling losses as a result of the effects of asset prices. When a large number of upstanding financial institutions suffer a severe financial shock, they face backlashes in their volume and performance. Thus, such an asset price plummet leads to a drop in the population's welfare, inducing yet another backlash on companies, in a descending financial perpetuum mobile.

Keywords*: currency crisis, financial crisis, banking system, the spiral of losses, Great Depression, speculative attack, the shock of the financial system*

1. THEORETICAL ASPECTS OF MONETARY CRISES

Monetary crises are characterized by the exchange rate dropping continuously across a short period of time. In first generation models (Flood and Garber (1978), Krugman (1979)), the collapse of a fixed exchange rate is caused by unsustainable fiscal policies. Extensions of these models which also include in their analysis consumer optimization, inter-temporal budget restrictions at a governmental level are found with Obstfeld (1986), Calvo (1987), Drazen and Helpman (1987), Wijnbergen (1991), Flood and Marion (1999).

The first generation models mentioned before are characterized by the fact that speculative attack time is deterministic, while the exchange rate does to depreciate at the moment of the attack. The solution to such methods is to introduce shocks (Flood and Garber (1984)).

These same models have proven, later on, that raising fiscal deficit, the level of state debt, lowering the national reserve precede the collapse of the fixed exchange rate system

(Corsetti, Pesenti and Roubini (1999), Burnside, Eichenbaum and Rebelo (2001), Lahiri and Végh (2003)).

However, the asian crisis, which started in 1997, proves a close connection between future public deficit and the current change in exchange rates. Dupor (2000), Daniel (2001), Corsetti and Mackowiak (2006) use fiscal price theory to prove that price and exchange rates modify as a response to future public deficit.

In these first generation models, the government exogenously adopts the decision regarding the waiver of the fixed exchange rate regime.

Second generation models, however, present the government adopting multiple rule solutions (optimal multiple) to solve a problem of optimal (maximum), determining if and, if so, when, they will abandon the fixed exchange rate regime (Obstfeld (1994, 1996). The Central Bank minimizes a quadratic loss function, depending on the inflation and real GDP variation compared to potential GDP (Barro and Gordon (1983), Jeanne (2000)).

Third generation models associate the effects of the Payment Balance with devaluation, by assuming that banks and companies from emerging countries borrow money in foreign currencies and give credits in their own currency. However, they are exposed to liquidity shock due to long-term project financing with short-term loans. (Eichengreen and Hausmann (1999)). It is, however, advantageous to expose yourself (as a company) to the exchange rate, if the financed project is guaranteed by the government (McKinnon and Pill (1996), Burnside, Eichenbaum and Rebelo (2001)).

A particularly difficult problem that arises refers to to interest rate policies during and after exchange rate crises. A solution in this matter was given by Christiano, Braggion and Roldos (2006), by raising interest rates during the crisis and immediately dropping rates afterwards.

2. THEORETICAL ASPECTS OF FINANCIAL CRISES

Financial instability (Mishkin (1994)) is characterized by financial system shock. Crockett (1997) says that financial stability refers to the associated stability of key financial institutions and markets, in the sanse that I) financial institutions included in the system are stable, trustworthy and continuously and uninterruptedly fulfill their contractual bonds, without outside financial assistance and ii) essential macroeconomic markets are stable.

Issing (2003) and Foot (2003) suggest that financial stability is intertwined with financial market bubbles or, generally, the volatility of proximal financial markets.

Haldane et al (2004) suggest the following definition: Financial instability can be defined as any deviation from the economic-investment plan on an economy level, which brings financial imperfections in the finance system.

Goodhart et al (2004, 2005, 2006) and Tsomocos (2003) generically say that financial instability is characterized by a high probability of loss or at least lowering of profit.

Until this last of financial crises, which went global, the following major financial crises emerged:
 – the Russian crisis, the Texas bank crisis and the crash of the USA Commodity Exchange, all in 1987
 – Mexico's financial instability (1995), the Asian crisis, Indonesia, South Korea (1997 0 1998), Russia (1998), Brazil (1998-1999). Their common denominator was a dramatic change in current account, a real and severe depreciation and significant decline in real output.

The Asian crisis was characterized economic recession, a growth in overall losses and banking system crisis.

With certain exceptions, the template to all crises seems to imply the following elements[1]:
 - After a period of massive inputs of capital, investors (both domestic and foreign)

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[1] Ely R.T., *International Financial Crises: Causes, Prevention and Cures*, Lecture by Lawrence H. Summers

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have decided to reduce the volume of assets owned in the country affected in response to changes in economic conjecture. The main sources are:

- concern over the viability of the exchange rate regiment (the vast majority of cases);
- large fiscal deficit (Russia, Brazil);
- high current account deficit (Thailand, Brazil);
- Emphasizing the failure of the financial sector.

These problems result from insufficient capitalization, supervision of banks, excessive leveraging mechanisms, warranties, etc.

– in the meanwhile, investors redirect their attention from situational analysis of the respective country to other investors' behavior analysis. Growing withdrawals from banks are generated from a psychological phenomenon which grabs hold of investors. It was observed in Mexico (1995), South Korea (1997) and seems to be a persistent trait of developed crises in emerging economies.

– withdrawal of capital generates reductions in the rates of Exchange. This leads to:
  – the depreciation of the exchange rate, reducing real income and expenses
  – increased pressure on asset movement
  – increased internal value of foreign currencies
  – reduced eligibility of internal debtors

The Mexican and Asian crises are living proof that informational assimetry can create a financial crisis. Thus, a series of events characteristic of a crisis2 can be delivered:

– with the onset of the crisis, fiscal deficits did not represent a serious problem for countries in crisis, therefore, inadequate fiscal policies could not have caused the crises

– inflation was relatively low

– a definite conclusion could not be drawn with regards to rising exchange rates of affected countries

– many of the countries affected by the crisis suffered large current account deficits

– asset entries in affected countries were large before the crisis; reversed after the onset of the crisis

– rising number of banks loaning money

– bilateral bank accounts deteriorating

– very low liquidity before the crisis

In Mexico, the GDP growth rate went down from over 4% in 1994 to -6% in 1995, whereas in Thailand, Malaysia, South Korea and Indonesia, it went down from 5% in 1996 to -5% in 1998. These major chances in GDP rates had the same magnitude as what happened in the USA during the 1929 crisis, also known as The Great Depression.

Choosing the suitable macroeconomic model

The choice is made through a strong connection between economic theory and existing data. With these in mind, Pagan (2003) classifies[3] as shown in figure 1.

The abbreviations mean as follows:

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[2] Mishkin F.S., *Global Financial Instability: Framework, Events, Issues*, The Journal of Economic Perspectives, vol.13, No.4, Autumn 1999.
[3] arrow indicates the direction of increasing of the amount of statistical data.

RBC - Real business cycle models - a model with infinite time horizon, representative, calibrated agent;

GE - General Equilibrium models - is a model with finite time horizon, representative, calibrated agent;

DSGE - Dynamic stochastic general equilibrium models - a model with infinite time horizon, representative, calibrated or estimated agent;

OLG - overlapping generation models - is a model with infinite, calibrated time horizon;

SVAR
VAR
DAE
FHGE
OLG
DSGE
GE
RBC

Figure 1. Pagan diagram concerning the choice of suitable macroeconomic model in relation to statistical data

FHGE - Finite horizon general equilibrium models - a model with heterogeneous agents, calibrated or estimated. Endogenous restrictions for liquidity and loss;

DAE - Dynamic aggregative estimated models - is a model with finite or infinite time horizon, large or small scale, reduced form;

VAR - Vector Autoregressive models - one model is estimated;

SVAR - Structural vector autoregressive models - one model is estimated.

3. CAUSES OF THE GREAT DEPRESSION OF 1929-1933

A first remark would be that the crisis of 1929 also originated in the USA.

– the severe deterioration of household balance sheets from 1929 to 1930[4]. In real terms, household debt went up 20%, but the value of financial assets did not keep up and went down, as a result of the stock market crash;

– in the post-war period, increasing debt was balanced by increasing financial assets and net worth (not the case during 1929-1930);

– acute drops in aggregated demand were the result of financial constraints on consumers, manifested only in high-income groups. This phenomenon was not a burden focused only on individuals with large numbers of stocks

– the banking crisis and collapse of the value of gold in the early 30's contributed to the severity of the Great Depression by rising[5] incertitude about interest rates, phenomena sustained by the following:

– rising incertitude (measured by risk bonuses, in terms of interest rate structure) from the bank crisis period is correlated in a positive manner with the financial market's volatility associated with dropping gold values

– risk bonuses explain a great part of variations in aggregated investments from the Great Depression

– successive banking crises had a devastating impact on trust, which increased risk bonuses of long term bonds, and transformed businessmen into suspicious debtors

– the federal reserve was forced to make drastic changes in its policy to make gold the valid standard, after

[4] **Mishkin F.S.**, *The Household Balance Sheet and the Great Depression*, The Journal of Economic History, Vol 38, No.4, December.1978.

[5] **Ferderer P.J., Zalewski D.A.**, *Uncertainty as a Propagating Force in the Great Depression*, The Journal of Economic History, Vol 54, No.4, December.1994.

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mass speculations that the US would face powerful devaluation in 1931. This policy made the system susceptible to high volumes of assets moving easier, contributing to the Great Depression by rising incertitude;

– during The Great Contraction, deposit institutions exited the banking industry faster than in any other time in the US's history[6], caused by:

> – deposit withdrawal, non-liquid assets and the Federal Reserve's unwillingness to act (Friedman and Anna (1971), Wicker (1996));
> – economic contraction by lowering asset prices, rising numbers of unpaid loans, banks' insolvency (Temin (1976), White (1984), Calomiris and Joseph (2003)).

4. SPIRAL OF LOSSES

Financial institutions fund new investments with loans and borrowed funds. Consequently, nowadays' financial system looks more like a complex network of financial obligations. With the addition of modern financial techniques such as bonds and options, institutions have more funding options than ever.

The problem becomes complicated and hard to control because most of these credit-related derivatives are transacted at a booth,

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[6] **Richardson G**., *Categories and Causes of Bank Distress during the Great Depression, 1929-1933: The illiquidity versus insolvency debate revisited*, Department of Economics, National Bureau of Economic Research, University of California, 3151, Social Science Plaza, Irvine, CA 92617-5100, USA , 2007

and not through a clearing house. Thus, the difficulty in estimating the risk exposure of every financial institution, and as a consequence the clearing house's inability to perform its beneficial purpose.

With every bilateral contract signed vis-a-vis a derivative credit, there is at least one additional risk for the parts involved.

The current financial shock is remarkable through what we may call the spiral of losses. This is a result of asset prices. When a large number of upstanding financial institutions suffer a severe financial shock, they face backlashes in their volume and performance. Thus, such an asset price plummet leads to a drop in the population's welfare, inducing yet another backlash on companies, in a descending financial perpetuum mobile.

Figure 2 shows the mechanism of the spiral of losses, with its most powerful impact being in the financial system, where banks obtain their required funding off the spot market.
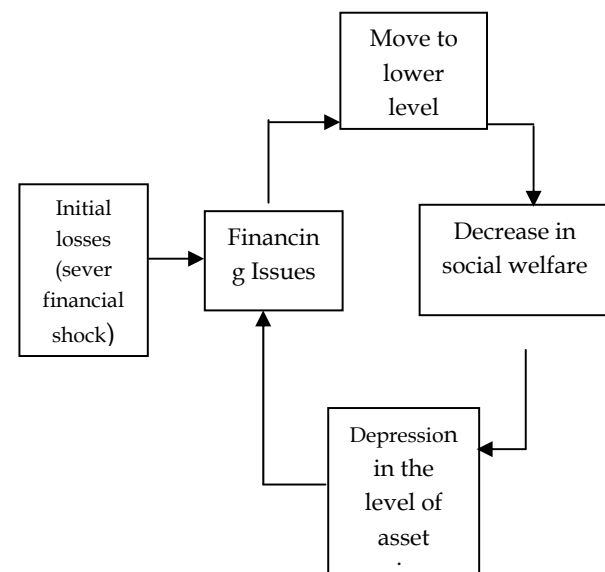

Figure 2. *Mechanism of losses spiral*

Given these circumstances, paying contracted credits is extremely sensitive to

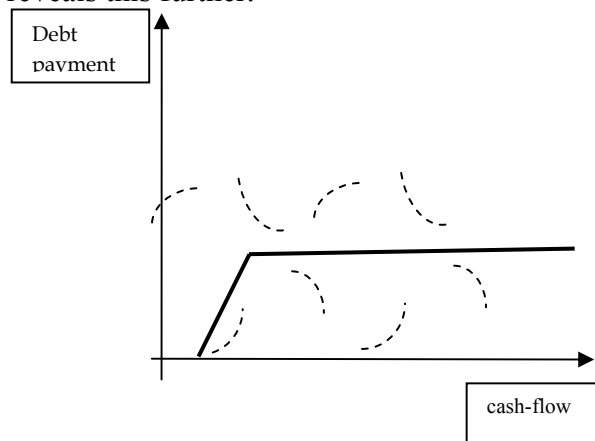information circulating the market. Figure 3 reveals this further.

Figure 3. *Sensitivity of debt payment to the information moving in the market*

In order to exemplify this web of inter-dependencies on the financial market, we have 3 banks:

If bank 1 spreads its assets and at the same time reduces the loan it gave out to Bank 2, this will automatically worsen Bank 2's situation. As a consequence, Bank 2 is forced so spread its assets and reduce the loan it gave to Bank 3, which in turn reduces its loan to Bank 1, thus closing the toxic circuit of the three banks being discussed.

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