The Financial Engineering and Management of Economic Crisis

LUO Dancheng, ZHOU Mingzhe
School of Economics, Shenyang University of Technology, P.R.China, 110178
donna_luo@sina.com

Abstract: History records many economic crises, but mankind has never been so close and so frequent to them as today. So soon after European Monetary System Crisis in 1992, Mexican Financial Crises crashed in 1994. In 1997, many countries fell into the Asian crisis. The United States at the outbreak of the sub-prime crisis in 2007. The crisis quickly spread to other regions and became a global credit crunch. Have a tremendous impact on the world's major financial institutions and global financial markets. The economic growth of the United States is slowdown. Have a certain negative impact on the world economy. With the globalization of the economic and financial, through financial and trade channels the impact on the Asian economy that caused by sub-prime crisis can not be underestimated. This paper provides an overview of the contemporary economic crises to examine how economic crisis is bred, how is it transmitted internationally, and how can it be prevented. Thus the paper develops a frame of “onset-transmission-prevention” to explore the contemporary economic crisis by incorporating analysis into economic globalization and differentiating it from the traditional economic crises.

Keywords: Economic crisis, Financial management, Financial Innovation

1 Introduction

Economic crisis has left economists pondering endless. Studies of the economic crisis at home and abroad are as follows:
Research the instability and the inherent vulnerability of the economic from the perspective and motor development of the economic cycle. Fisher studied the instability of the mechanism under the conditions of the market economy. John Maynard Keynes built a macroeconomic model in 1936. Hyman P. Minsky Improve and enrich the Keynesian theory.
History point of view of economic crisis. Charles P. Kindleberger provide the institutional framework for financial crisis from the perspective of historical.
Research the modern third-generation model of the formation of the economic crisis. The first generation of theoretical models was represented by Paul R. Krugman,Flood and Garbor. The second generation of theoretical models was represented by Obstfeld. The third generation of theoretical models was mainly about moral hazard.
Research on the economic crisis. For example, the book called ‘Big Warning’ was written by Zheng Zhenlong, Cheng Siwei ‘Analysis of the East Asian Financial Crisis’ and Li Kemu ‘The Impact of the End of the Century’ and so on.

2 An Overview of the Economic Crisis

Economic Crisis refers to one or more of the national economy or the world economy continues to shrink in the relatively long period of time (Economic growth rate is negative). Anything of the world can not happen or develop like beeline, and the development of economy can not go along as stably as possible. Economic crisis, which is a phenomenon of the macro-economics, is one of the most inevitable phenomenon. The history of the economic development indicates that any economic system will appear serious wave and crisis in the course of its movement. Many economists have made comprehensive and profound researchers and acquired abundant achievements in the field of economic crisis. During the shunt period of Chinese, market economy has made rapid development. But at the same time, the factors of crisis have been accumulating. In order to abate or avoid the serious destroys, the Early-Warning index system of economic Crisis must be constituted. By this means, we
can predict the serious danger of the economic movement and take fast actions to father.

3 The International Transmission Model of Economic Crisis

Paul Masson Jumps between Multiple Equilibria Self-fulfilling expectations model to explain the currency crisis of contagion effect. Its theoretical basis is currency crisis of Multiple equilibrium model, which is advanced by Obstfeld who is the representative of Second-generation of the financial crisis. It is a representative modern conduction model of economic crisis.

He set up a simple model of two countries. In this model, when foreign exchange reserves at a certain level, depreciation will happen. This is consistent with model of Paul R. Krugman, Flood and Garbor. Model assumptions include two emerging market countries. They will suffer the impact of external environment. First consider a country (Use the following subscript a to indicate the corner, distinguish another emerging market countries to b), it has accumulated a foreign debt D, pay a floating interest rate, assuming that there is no new net capital flows. When reached the point caused by the crisis, Government, for all current account deficit (or surplus) financing but the addition and changes in reserves. Trade balance T faces many uncertainties impacts, if they are sufficient to lead to the critical level of reserves $R$ down to $R'$, the depreciation ($\delta\%$) occurred. Currency conversion used to express the balance, $S_t$ is the spot foreign exchange prices of the day, $S_{t+1}^d$ is the value of depreciation of the next period (Otherwise another $S_{t+1}^d = S_t$). The capital gain is:

$$E_t[ln(1+r_t)/S_{t+1}^d/\pi_t,ln(S_{t+1}/S_t)(1-\pi_t)/ln(1+\delta)] = r_t - \pi_t ln(1+\delta)$$

In this way, the risk-neutral investors with risk-free (foreign) interest rate ($r^*$) equal to the premium payment (assuming a fixed $r^*$). The devaluation of the probability of occurrence $\pi_t$, multiplied by the expected depreciation of the extent of $\delta%$. Described below, the possibility of crisis is also very much the same as those who will be the impact of the expected ring, forming a possibility of multiple equilibria. Changes in reserves are given by the following equation:

$$R_t+1 - R_t = T_{t+1} - (r^* + \pi_t \delta)D$$

When $R_{t+1} - R < 0$ when the crisis occurred at $t+1$. Therefore, the probability of crisis during the formation of $t$, period $t + 1$ is:

$$\pi_t Pr_t[T_{t+1} - (r^* + \pi_t \delta)D + R_{t+1} - R']$$

Suppose $b_t = T_{t+1} - r^*D + R_t - R'$, $\alpha = \delta D$, The model is:

$$\pi_t Pr_t[b_t - \alpha = \delta D]$$

The possibility of multiple equilibria depends on the value of a and $\Phi_t$, If the variable $b_t$, to be changed $\varepsilon_t = b_t - \Phi_{t-1} \varepsilon_t$

Usually the distribution of $0$ and variance $\sigma^2$, equation used to establish that $b_t, \pi_t, \Phi_t | \alpha$. $\Phi$ is the normal distribution of variance $\sigma^2$ represent c, d, f. This formula defines the investors reasonably be expected to constitute.

GDP debt levels is assumed to be 5% and 25% , and the value of $\Phi^m$ and $\Phi^m$ is converted to related initial reserves. Marked by $R^m_{min}$ and $R^m_{max}$, calculated as follows: $R^m_{min,max} = \Phi^m_{min,max} - E_t T_{t+1} + r^*D + R'$.

<table>
<thead>
<tr>
<th>$D$</th>
<th>$\Phi^m_{min}$</th>
<th>$\Phi^m_{max}$</th>
<th>$R^m_{min}$</th>
<th>$R^m_{max}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>2.91</td>
<td>3.34</td>
<td>2.91</td>
<td>3.34</td>
</tr>
<tr>
<td>70</td>
<td>3.81</td>
<td>8.69</td>
<td>5.06</td>
<td>9.94</td>
</tr>
<tr>
<td>75</td>
<td>4.23</td>
<td>14.52</td>
<td>6.73</td>
<td>17.02</td>
</tr>
<tr>
<td>100</td>
<td>4.50</td>
<td>20.50</td>
<td>8.25</td>
<td>24.25</td>
</tr>
</tbody>
</table>

Therefore, $D$ equal 25% GDP (As in the past, the assumption is 2%). The initial value of reserves between 2.91% and 3.34% GDP level is allowed the occurrence of multiple equilibria. Below 2.91%,only a single (high)value is establish. More than 3.34% in the devaluation will not happen, Self-fulfilling crisis does not occur. The growth of D range and significant expansion is as the table 3.1. For $D$ equal 100% GDP, reserves between 8.25% GDP and 24.25% GDP, the multiple equilibria will be
allowed to occur.

4 Preventive Measures of Economic Crisis

4.1 Speed up financial institutions reforms and improve the micro-organization system
The reform of financial institutions, are not mergers and restructuring, the business quality should be improved. First of all, establish a sound deposit insurance system. After the settlement of shares, a person is unable to provide an unlimited line of re-lending to the banks and the credit risk. Second, impel the company's management structure, promoting the diversification of the structure of property rights. Wholly state-owned unitary change in capital structure and improve the modern enterprise system, in particular property rights system. Finally, for diversification, innovative product portfolio and improve the international competitiveness.

4.2 Establish the most of the system, strengthen and integrate the functions of regulatory authorities
First of all, the People's Bank and regulatory authorities should strengthen the financial sector on compliance and legal aspects of supervision. Formulate the financial regulations in line with the socialist market economy. Increase commercial banks’ supervision of compliance and legal aspects. Reduce commercial banks’ monitoring of the operational effectiveness. Second, establish a strict system of market access and exit. Later, the work is focused on financial institutions to promote the improvement of the quality, rather than quantitative growth. In addition, the People's Bank plays a bank function. In addition, the central bank should seek to open market operations, effective regulation of market liquidity. Finally, to strengthen financial stability functions of the People's Bank.

4.3 Open up the capital projects, the progressive realization of financial liberalization
First of all, open the capital account carefully. To open up long-term capital flows, release the short-term capital flows. In the framework of long-term capital, to open up direct investment, then open up portfolio investment. In the framework of portfolio investment, bond investment to open up, after the liberalization of stock investment. In all forms of capital flows, the first opening up the capital inflows, after the liberalization of capital outflow. Secondly, the realization of the exchange rate, On the one hand, strengthen the foreign exchange market maker of construction and improvement of the energy, as much as possible to improve the level and quality of service. To establish the basis of market supply and demand of the floating exchange rate, the further improve the RMB exchange rate formation mechanism.

4.4 Reserve system reform, expanding investment channels
At present, central bank to hold foreign exchange reserves, means that a large number of base money into the market, and the base money multiplier effect of monetary. Reform the current system of foreign exchange reserves, to encourage more foreign exchange in the banking system and retention and to improve health in people's possession limit. Then need financial institutions to expand the use of means of foreign exchange, banking and financial services innovation, in order to provide more investment channels.

4.5 Participate in international financial cooperation actively
Through the establishment of a wide range of information networks, information exchange, mutual exchange of experts to give lectures, to send school personnel to fully learn the advanced experience of foreign countries. Through the establishment of China's foreign-funded financial institutions and the Chinese branches of foreign financial institutions to strengthen financial supervision and with the countries of the bilateral or multilateral cooperation. The foreign financial supervision and management experience and the advanced stage of the specific conditions of China are closely linked with Chinese characteristics to explore the path of financial development and regulatory. The further opening up of financial services, so that more foreign financial institutions into the Chinese market, this will increase
the number of attracting foreign investment can help China to train professional and technical personnel, in the long run will be beneficial to China's financial supervision level.

5 Conclusion

China's economy has gone through years of rapid growth, high investment rates of domestic and international economic prosperity of the surface obscures the serious potential financial risks. A concrete performance of the real estate bubble is the stock market bubble and the banking system and bad debts. With China's accession to the WTO, the national economy in most areas is full liberalization of the external. China's economy will be fully with the international integration of the various transmission channels of financial crises are a reality in our country's soil. Due to the international capital market volatility and unpredictability remain, not the value of regional development, countries in economic, financial and even political defects could cause the next outbreak of the financial crisis. Specifically, the domestic financial system should be sound, and improve financial supervision; external should promote the liberalization of international trade, and then promote the long-term liberalization of international capital flows, and then short-term international capital flows to promote the liberalization. We should seize the current global economic opportunities for the overall smooth running, adjusting the economic structure, to formulate relevant strategies to prevent or even ahead of the next to resolve the economic crisis.

References